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**COMMERCIAL BANK PERFORMANCE IN A DEVELOPING
COUNTRY: A CASE STUDY OF NIGERIA**

By

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M.Sc. (Banking and Finance); FCIB; FCIS; FNIM; FInstD; FIMgt; FRC.

**A Thesis in the Department of Banking and Finance, Business School,
City University, London, in Fulfilment of the Award of**

**Doctor of Philosophy
in
Banking and International Finance.**

JUNE, 1993

DECLARATION

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DEDICATION

**Dedicated to all professional men and women
who believe in blending practical experience
with theoretical knowledge.**

*Such men and women strive tirelessly for
excellence through self-improvement. Their thirst
for knowledge is strong, unquenchable and
everlasting. They are fully persuaded that learning
is a continuous process which must never stop
until the last breath is taken.*

ACKNOWLEDGEMENT

First, I must thank **God** for the generous gift of near-perfect and robust health with which I have been blessed. But for this most precious gift, it would have been impossible for me to continue to task my physical and mental resources the way I have done in the last decade.

Second, I wish to thank **Amoke and Moina** for their support, encouragement and patience throughout the period of the research.

I must acknowledge the guidance I received from my supervisor, **Professor Zannis Res**, of City University Business School, to whom I am highly indebted not only for his guidance, but also for his constructive criticisms and comments, which, consequently, largely moulded my mode of presentation, type and depth of analysis resulting in more meaningful interpretation of results and conclusions. No doubt his criticisms have helped to improve the quality of the thesis. Professor Res also recommended some authoritative literature to me, which I found relevant to the subject of my research. I thank him profoundly for all the assistance.

In the last 5 years I have also consulted **Dr. 'Doyin Soyibo**, a Senior Lecturer in the Department of Economics, University of Ibadan, and my resident supervisor, and have benefitted immensely from the useful suggestions he made at various stages of the study.

I must also record my profound gratitude to my colleagues, the Chief Executives of the 24 commercial banks, who provided me with valuable data on their banks by completing an unusually long questionnaire, without which the study could not have been conducted and completed conclusively. They were faced with the onerous task of providing comprehensive quantitative and qualitative information as were requested for in the more than 10-page questionnaire. They were also required to make detailed comments on certain fundamental and sensitive issues. Most of them gave this request their personal attention and made incisive comments that were

iii.

extremely germane to, and also aided the focus and conclusions of this thesis. I must, in this regard, single out the following Chief Executives: **Mr. Y. Bioye Oyeleke**, then of National Bank of Nigeria Ltd; **Mr J. O. Sanusi**, then of United Bank for Africa (UBA) PLC; **Mr. S. S. Baffa**, then of Union Bank of Nigeria PLC; **Mr. Amirapu Somasekhar** of Nigeria International Bank Ltd; and **Mr. S. C. Kabadkar**, then of Owena Bank of Nigeria PLC, for the degree of completeness and comprehensiveness of the quantitative information and comments submitted by them. I was overwhelmed and encouraged by the personal interest they showed in the project.

During the course of the research I consulted **Dr. Tunji Sobodu** on aspects of the analyses requiring considerable use of computers. He was also kind enough to make suggestions and comments at different stages of the work, which included reading the final draft and making very useful suggestions. Messrs. **R. K. O. Osayameh**, **Ade Ayoola**, **Mike Uzor**, **P.O. Akiode** also read through the final draft and made some suggestions towards its improvement. I am full of thanks to all of them for their contributions.

I thank **Alhaji S. O. Shittu** and **Mr. Bolaji James** who were at one point or the other in the course of the study, my Personal Assistant, and **Miss Bolanle Olaore**, Secretary, for sparing the larger proportion of their leisure time to type various portions of the manuscript speedily and accurately.

At this juncture, I must thank the Chartered Institute of Bankers, London; and the University of Ibadan for giving me the necessary professional training and intellectual capacity necessary for the production of this thesis.

I would like to thank all staff of the City University Business School, London, particularly **Mrs. Phyllis Brand** for her support and assistance throughout the period of conducting the research.

FEMI A ADEKANYE

Lagos.

June, 1993

ABSTRACT

Inspite of the fact that banking has been practised in Nigeria for about a hundred years, little is still known about the characteristics of Nigerian banks as well as what factors determine their performance, that are essentially typical of banks operating in developing economies, particularly those of Africa. This study represents a research effort aimed at contributing to the literature on the determinants of commercial bank performance in general, and in developing economies in particular.

The study employs univariate tests in addition to both the discriminant and logit techniques of analyses to determine which factor(s) are major determinants of commercial bank performance, using Nigeria as a case study and over the period of Structural Adjustment Programme (SAP) (1987-1989) as well as the last two years prior to this period (1985-1986). We are, thus, able not only to identify these bank performance factors for each year during the five year period (1985-1989), but also to observe the trend over both periods and consequently compare developments pre- and since SAP. It also attempts to identify factors that distinguish Nigerian commercial banks by type of ownership, head-office location as well as banks with technical partners from those without.

We establish that managerial efficiency remains the most important determinant of commercial bank performance over both the pre-SAP and SAP periods. Over the entire study period vulnerable banks were shown to be significantly less efficient compared with the resistant banks. With respect to the SAP period, we find that such factors as capital adequacy and liquidity have begun to be significant performance factors only since the more recent years of the SAP period.

The conclusions from the techniques of analyses were also corroborated by our critical examination of the National Bank of Nigeria, which is perhaps the most financially vulnerable of the operating banks in Nigeria to date. Through this, we establish the critical nature of the composition and actions of a bank's board for its performance. The incessant clashes between the management and boards of Nigerian banks is also established as a significant hinderance to sound bank performance. This has also caught up with the new banks, thereby threatening industry's survival.

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Glossary of Terms

Resistant Bank This represents a sample bank whose return on assets is at least the specified cut-off going by different criteria.

Vulnerable Bank This represents a sample bank whose return on assets is less than the specified cut-off going by different criteria.

Out-of-Sample Bank This is a bank which is not included in the sample upon which analysis (estimation) is based.

Binary Choice Model A regression model having as its response or dependent variable, a binary choice variable.

Discriminant Reclassification This refers to an aspect of the discriminant method which attempts to reclassify sample or out-of-sample banks based on the estimated discriminant function in an assessment of the accuracy of the discriminant model.

Banks and Other Financial Institution Decree (BOFID) The Decree was promulgated in 1991 as a legal regulatory framework for Nigerian commercial and merchant banks as well as such other financial institutions as Insurance companies and finance firms, among others.

Prudential Guidelines This refers to a set of guidelines issued by the Central Bank of Nigeria (CBN) in November 1990 to aid Nigerian Banks in making appropriate and adequate provisions for loan losses and risk assets in a uniform manner; thereby promoting the revelation of the true quality of bank's assets.

PROC TTEST This refers to the command for activating the T-Test (of hypothesis) option in the SAS Software which was used for the various analysis conducted in this study.

PROC STEPDISC This refers to the command for activating the stepwise discriminant analysis option in the SAS Software.

SAS Software This represents a computer software designed to aid the conduct of different types of statistical/mathematical analyses.

Resubstitution Analysis This refers to the method of assessing the accuracy of discriminant and logit models respectively by using the estimated model to attempt a reclassification of sample members.

Cross-validation Analysis This refers to an alternative method of assessing the accuracy of discriminant and logit models respectively by estimating in rotation the model without a sample member and then using the estimated model to attempt a reclassification of the out-of-sample member.

False Positive Rate This represents the proportion of vulnerable banks wrongly classified by the discriminant/logit model as resistant.

False Negative Rate This is the proportion of resistant banks wrongly classified as vulnerable by the discriminant/logit model.

Sensitivity (SSY) This is the term used in the SAS Software to mean the proportion of resistant banks correctly classified as resistant.

Specificity (SFY) This term is used in the SAS Software to mean the proportion of vulnerable banks correctly classified as vulnerable.

Correct Classification Rate (CC) This represents the proportion of sample banks whose health status were correctly reclassified.

Misclassification Rate (MC) This represents the proportion of sample banks whose health status were wrongly classified.

CHAPTER ONE

INTRODUCTION

Some years ago, it was the general belief that banks must be heavily capitalised in order to survive. This school of thought suggests that capital adequacy is fundamental to bank performance. However, bank capital ratios have been declining steadily since the early 1800's when capital ratios were extremely high thereby bringing to the fore the relevance of some other factors which in fact seem to be more important than capital. The ratio of capital funds to total assets in the United States of America (USA) during this period was in the 70% range, but by 1900 it had dropped to 20%. Following expansion of banks' assets during the war and post-war economic expansion of the 1920s, the ratio dropped further to 13%. From 1945, the depression year, the ratio fell to an all-time low of 6%. Again during the second post-war years, the ratio adjusted to just under 10% before stabilising at 6 - 10% range in the early '70s. The credit crunch of the sixties finally drove home the practical lesson that the strongest capital ratios do not necessarily guarantee solvency. So much emphasis had been placed on bank capital as if it represents the only or even the major determinant of bank performance.

Vojta's (1973) extensive pioneering research into the subject validated the conclusion that strong capital ratios do not insure liquidity and solvency, and the need to re-examine the question of bank capital adequacy along with related concepts of liquidity, profitability, management, and risk was clearly established. One authoritative study of the capital of banks which failed and those which survived during the period 1921 - 31 in the U.S. showed that the capital ratios of banks which survived were lower than for those which failed (Wriston, 1973). Other scholarly research indicate that most of the banks which have closed their doors in the past met or exceeded capital ratio tests applied by regulators immediately prior to their bankruptcy. In addition to relating the level of bank capital to historical figures,

subsequent works on re-definition of capital adequacy attempted to use scientific techniques to forecast future performance for capital adequacy purposes. These were in response to the challenge posed by the problem of the determination of adequate level of capital for banks.

Interestingly, the regulation of banks goes back to the ancient world spanning through Babylonian, Greek, Egyptian and Roman civilisations. Over the years, special attention had been given to bank capital, liquidity and asset quality for bank performance. The need for control and regulation of banks in view of their importance to the national economy has been highlighted by several writers including Wood (1970, 1983), Teriba (1986a, 1986b), Onimode (1986), Oyejide and Soyode (1986b, 1986c, 1986d), Nwankwo (1976) and Adewunmi (1984). In their intermediation role between financial resources and production as well as consumption, banks influence the volume of purchasing power available for the investment and consumption expenditure (Oyejide and Soyode, 1986b). They do this through their power to expand and contract credit. They provide facilities for the effective mobilisation of savings and channel the funds mobilised into investments through the process of granting credit facilities to their customers. Thus, the funds mobilised are made available to businesses to enable them expand their productive capacity and to individuals and households to facilitate consumption. However, their ability to facilitate credit depends to a large extent on their capital base.

Another characteristic of commercial banks which distinguish them from other financial institutions is what Wood (1983) described as the high degree of liquidity of their demand deposits. It is generally acknowledged that the greater proportion of money supply in a modern economy is demand deposits, the bulk of which is money created by commercial banks. Thus, as a group, banks are the principal suppliers of money. They, in the process, therefore, influence the general price level and facilitate or hinder efforts of governments in solving the perennial problem of inflation. This important position of banks in the economy makes them subject to official intervention and control. As a result, banks all over the world are the most regulated of all businesses (Adekanye, 1986; Oyejide and Soyibo, 1987). Funds

mobilised by them are managed strictly in accordance with certain statutory regulatory or policy requirements laid down by government and relevant monetary authorities.¹ Such controls may stipulate the liquidity ratio or others in respect of capital adequacy, solvency, maximum lending limit, levels of interest rates, etc.

The degree of solvency has often represented a signal towards the extent to which banks could perform their roles effectively. In assessing solvency, capital has always been an important factor because of its role in absorbing losses. It is a deliberate intention to elaborate further in the next few paragraphs on this issue of capital with a view to validating recent thoughts on its importance or otherwise for banks' performance. As the study would later reveal, there is no agreement between banking practitioners and the monetary authorities as to what constitutes capital and what quantity may be regarded as adequate. What one bank regards as adequate cushion may not be adequate for another. Oduyemi (1981) confirmed that the adequacy of capital depends on each bank's risk characteristics, its management and competitive environment. Although it is desirable for a bank to maintain adequate capital, yet several writers have argued that bank failures may not necessarily be caused by inadequacy of capital. In the words of Watson (1975), there is no amount of capital that will salvage a bank which is grossly mismanaged. Conversely, a strong, well-managed bank can operate on a very thin capital base. The importance of management or better still, managerial efficiency is thus also emphasized.

The two major functions of capital are consequently:

- a) to permit acquisition of the institutional structure necessary to perform the intermediation function and provide related services. Capital funds permit an enterprise to acquire the physical skill base to compete in the market place; and
- b) in conditions short of total economic collapse, to provide protection against

¹ We rightly note that regulations may be of different forms among which may be, statutory, official non-statutory, self-regulation by the sector, monetary policy, intervention and/or industry structure restrictions.

unanticipated adversity leading to loss in excess of normal expectations.

The capital provision against excessive loss permits the bank to continue operations in periods of difficulty until a normal level of earnings is restored. Thus, capital provides protection against unexpected loss. Since loss is related to business risk, risk exposures in commercial banking must be explicitly recognised.

Bank losses arise because of the nature of risks inherent to banking business. All business operations involve some element of risk; in banking there is a special relationship between risk and the operations of banks in the sense that banks, as financial intermediaries, are in business to reduce the risks in financial transactions for both depositors who place money in their care and borrowers who use these funds. Given the consensus that capital should be adequate to absorb losses, it is considered appropriate that the types of risks which cause losses be identified.

For capital adequacy purposes, Vojta (1973) and Revel (1975) identified the following risks which are peculiar to the operations of banks and other financial institutions. These are: (1) credit risks (losses on the loan portfolio); (2) investment risks (losses in the value of marketable securities and fixed assets); (3) liquidity risks (losses arising from financing mismatches in the tenor of assets and liabilities); (4) operating risks (losses arising from operating errors and inefficiency); (5) fraud risks (losses arising from dishonesty, fraud and forgery by bank staff, etc); (6) fiduciary risks (losses arising from the improper discharge of fiduciary responsibilities); (7) earning risks (losses arising from changes in interest rates, asset prices and operating expenses) and (8) spill-over/foreign exchange risk (losses arising from subsidiaries or through foreign exchange contract).²

In Nigeria, it does not appear as if banks pay sufficient attention to capital, liquidity, asset quality and risk except profitability in their day-to-day operations. Yet these variables are very important and indeed crucial in a country like Nigeria that is understandably in haste to develop the banking habit among its citizenry.

It is in the light of the foregoing that this study will examine the conceptual

² It should be noted that these risks are by no means independent.

framework as well as practical realities of not only capital adequacy, but also liquidity, solvency and managerial efficiency of Nigerian commercial banks and analyse, through various financial ratios, their importance for commercial bank performance in Nigeria using various techniques, with a view to making policy recommendations that can ensure a virile and competitive banking system in the country.

1.2 The Objectives of the Study

The following are the specific objectives of this study:

- i) to analyse the capital adequacy, liquidity and other financial characteristics of Nigerian commercial banks with a view to identifying which banks are potentially vulnerable to financial difficulty compared with those that are not;
- ii) to provide an indication of Nigerian commercial banks' ability to withstand adverse economic and financial developments from data that are readily available without on-site examinations;
- iii) to evaluate and assess descriptive indices and financial ratios that can be used to classify Nigerian commercial banks into those that are resistant to adverse financial and economic conditions taking into consideration the peculiar conditions and environments; such indices are those that can be easily used by bankers without statistical or analytic sophistication;
- iv) to carry out more sophisticated (confirmatory) analysis of the classification of Nigerian commercial banks into resistant and vulnerable banks according to a variety of performance criteria, using Multivariate Discriminant Analysis (MDA), and Logit analysis with a view to identifying which of the indices or combination of indices, may be used to distinguish between vulnerable and resistant banks;
- v) to provide the Nigerian regulatory authorities with alternative approaches that can be used as track signals for identifying problem or vulnerable banks early enough with a view to nipping bank failures in the bud before they occur; and
- vi) to offer policy recommendations based on the results of the study; in particular, to offer such recommendations that can achieve efficiency in the

allocation of supervisory resources devoted to preserving and encouraging a sound and competitive banking system in Nigeria.

1.3 Scope and Coverage of the Study

This study covers commercial bank performance in Nigeria. Performance in the context of the study is to be determined as part of the focus of the study's objectives. The study period covers a five-year period spanning 1985 to 1989. This period covers a considerable part of the pre-Structural Adjustment Programme (SAP) period as well as three years of the implementation of SAP. This is deliberate as the aim is to provide the possibility of investigating bank performance under both policy regimes and possibly the structural changes that had taken place in the industry since SAP. The study also covers only those Nigerian commercial banks which had existed prior to the adoption and implementation of SAP.

1.4 Study Plan of Thesis

In order to achieve the objectives of this study we have mapped out a plan which is exemplified by the layout of the thesis as indicated in the table of contents. Following this introduction, we examine the characteristics of the Nigerian banking industry and relevant developments in both the industry and the economy as a whole. The regulatory and supervisory framework within which the banks have been operating is also discussed, especially over the period of deregulation. Observations from these discussions would bring out some important factors on the performance of banks.

Next a detailed review of literature on banking theory and the significance for bank performance of such factors as capital adequacy, asset quality, managerial efficiency and liquidity, among others, is undertaken. This, in conjunction with a review of studies which have been based on the identification of factors which distinguish the performance of different banks is expected to give a more complete picture revealing the essential components of our research. This would include the various techniques of analysis which have been adopted.

Further to this, a comparison is made between various techniques of analysis which are identified to have been adopted in the literature with a view to selecting an appropriate one. In addition, the univariate T-Test is conducted to assess the individual significance of the financial ratio which is identified to be a potential distinguishing factor of bank performance. Having selected the appropriate technique(s), we conduct an analysis of bank performance determinants. The conclusions of the analysis are then examined for their significance in our assessment of the National Bank, which is deemed a good example of a vulnerable bank.

1.5 Organisation of the Thesis

Based on the above study plan, this thesis is divided into nine chapters. Chapter two discusses commercial banking and bank performance in Nigeria. Chapter 3 reviews the literature and related studies on the theory of the banking firm, capital and bank performance. In chapter 4, the research methodology is presented while the description of survey results follows in chapter five. Chapter six deals with the discussion of univariate results while the results of the regression analyses, both discriminant and logit, are discussed in chapter seven. In chapter eight we take a closer look at the National Bank of Nigeria, often viewed as a good example of a vulnerable bank and consider the relevance of significant performance factors identified by the regression analyses. Chapter nine presents the summary of the study, its conclusions, implications and recommendations. The suggestions for further research are also indicated.

CHAPTER TWO

COMMERCIAL BANKING AND BANK PERFORMANCE IN NIGERIA

2.1 Evolution of Commercial Banking in Nigeria¹

The history of commercial banking in Nigeria dates back to August 1891. In that year, the African Banking Corporation (ABC) which was operating in South Africa was persuaded by the local agent of Elder Dempster & Co., a Liverpool based shipping company, to open an office in Lagos. The owners of the bank were so enthusiastic about the invitation to operate in Lagos that instead of basing their decision on pure commercial judgement, they relied on the assumption that Elder Dempster & Co. would ensure a successful operation for the bank in Lagos. This initial enthusiasm was, however, dampened by the delay in granting the bank the right to import silver coins from the Royal Mint in London for distribution in Nigeria as originally planned.

Barely two months after securing the right, in January 1892, Lagos suffered a trade depression and under the worsening trading relations, ABC grew continuously regretful of its decision to operate in Lagos. It, therefore, welcomed Elder Dempster & Co's offer to buy over the bank without hesitation, a deal that was concluded in March, 1893. The bank was, however, absorbed later by the Bank of British West Africa (BBWA) which was incorporated in March, 1894. It is, therefore, safe to conclude that ABC was the first bank that ceased to exist as a distinct corporate entity in Nigeria.

At this period, BBWA had the monopoly of importing silver coins into Nigeria and by 1908, this monopoly had been extended to cover the entire West Africa. It

¹ This chapter has benefitted considerably from Adekanye, F. A. (1982) The Elements of Banking in Nigeria (F & A Publishers, Lagos & Graham Burn Publishers, Leighton Buzzard, Beds, U.K.)

was, however, in that year that its monopoly of banking business in Nigeria was challenged with the establishment of the Anglo-African Bank. Interestingly, the new bank which was later renamed Bank of Nigeria could not withstand the fierce competition posed by BBWA which eventually bought it over four years later in 1912. BBWA thus remained the only bank in Nigeria until 1917 when the Colonial Bank was established. Of importance is the fact that acquisition proposals were made by BBWA at three different times between 1917 and 1938 which Colonial Bank turned down at the various instances.

In 1925, the Colonial Bank was absorbed by Barclays Bank to form an integrated international banking group with several largely autonomous entities and the new bank was named Barclays Bank (Dominion, Colonial and Overseas (D.C.O.)). Barclays Bank remained BBWA's greatest rival and the two banks dominated Nigerian banking until the British and French Bank, which was later incorporated in Nigeria as United Bank for Africa Limited (UBA), entered the scene in 1948. BBWA dropped the word British in its name in 1956 to reflect the emerging independent status of West African countries where it did business. It became known as Bank of West Africa (BWA). This was later changed to Standard Bank of Nigeria Limited in 1969 and ten years later, the bank's name became First Bank of Nigeria Limited. It has since reflected its public limited status by adding the letters Plc in place of limited. Barclays Bank (D.C.O.) was also to change its name to Union Bank of Nigeria Limited in 1979, following the political rift between the parent bank, Barclays Bank PLC of U.K. and the Nigerian government, under General Olusegun Obasanjo, over the former's business relationship with South Africa.

It is noteworthy that up to the end of the second decade of the century, no attempt was made to establish a purely indigenous bank. However, spurred by the resentment of Nigerian businessmen to the policy of the expatriate banks which, though solicited deposits from them, declined their credit requests, the first indigenous bank, Industrial and Commercial Bank, was established in 1929 by a group of Lagos-based Nigerians. This first endeavour, however, came to a hitch soon as the bank tried to do what expatriate banks were unwilling to do: lending to indigenous

businessmen. It ran into problems with its too liberal credit policy which led to its liquidation after about one year of operation. In 1931, another bank, the Nigerian Merchantile Bank was set up and headed by the same Managing Director under whom the Industrial and Commercial Bank had liquidated the year before. It also failed in 1936 due to adverse business conditions.

In 1933, National Bank of Nigeria, the first surviving indigenous bank, was established by a group of businessmen but was later taken over by the Western Regional Government of Nigeria, now succeeded by Oyo, Ogun, Ondo and Osun states. The survival of this bank is attributed to its relatively superior management quality and perhaps the patronage of the Regional Government. The success of the bank thereafter encouraged indigenous banking interests in Nigeria to a large extent. Another surviving early indigenous commercial bank, Wema Bank PLC, was established as Agbonmagbe Bank in 1945. African Continental Bank, today one of the three largest inter-state banks, (others being National Bank and Bank of the North) began with the buying over of the entire shares of Tinubu Properties Limited, a Lagos based company owned by, Dr. (then Mr.) Nnamdi Azikiwe in 1944. Dr. Azikiwe later became the First President of an independent Nigeria. The company was transformed into a bank known as Tinubu Bank Limited in 1946, and was renamed African Continental Bank in 1947. It is noteworthy that the success of the earliest indigenous banks (National Bank, Wema Bank and African Continental Bank) could in one way or the other be linked to the involvement of the regional governments.

This new consciousness continued with vigour into the 1950s, a decade that marked an unprecedented boom in banking registration. During that period, several indigenous banks were floated, but most of them folded up as rapidly as they opened their doors to customers.

Indeed, the indigenous banking history of the pre-independence era is strewn with more records of failures than successes (Table 2.1). By 1954, 21 of the 25 newly floated indigenous banks had folded up, 15 of them liquidating in 1954 alone. With the exception of two inter-state co-operative banks and International Bank for West

Table 2.1: Commercial Banks That Failed in Nigeria

S. No.	Name of Bank	Year Established	Year Failed
1.	African Banking Corporation	1892	1893
2.	Anglo-African Bank (Later Bank of Nigeria)	1899	1912
3.	Industrial And Commercial Bank	1929	1930
4.	Nigerian Mercantile Bank	1931	1936
5.	Nigerian Penny Bank	1940	1947
6.	Nigerian Farmers and Commercial Bank	1947	1952
7.	Pan Nigerian Bank	1951	1960
8.	Standard Bank of Nigeria	1951	1954
9.	Premier Bank	1951	1960
10.	Nigerian Trust Bank	1951	1954
11.	Afroseas Credit Bank	1951	1954
12.	Onward Bank of Nigeria	1951	1954
13.	Central Bank of Nigeria	1951	1954
14.	Provincial Bank of Nigeria	1952	1954
15.	Union Bank of British Africa	1952	1954
16.	United Commercial (Credit) Bank	1952	1954
17.	Cosmopolitan Credit Bank	1952	1954
18.	Mainland Bank	1952	1954
19.	Group Credit & Agric Bank.	1952	1954
20.	Industrial Bank	1952	1954
21.	West African Bank	1952	1954
22.	The Merchants Bank	1952	1960
23.	Muslim bank	1958	1965

Source: Adekanye, F.A. (1982) Elements of Banking in Nigeria
(F & A Publishers, Lagos).

Africa, the second French-owned bank established in Nigeria in 1959, none of the numerous banks formed in the 1950s survived beyond 1960.

The high mortality rate of indigenous banks is explained by acute capital inadequacy, lack of managerial expertise and illiquidity. According to Nwankwo (1980) quoting Paton (1949), in one instance neither the promoter nor any of his associates had even a rudimentary idea of banking or company practice. Of particular impact on the banks established in the 1950s were suffocating political pressures and compromises at a period when the crusade against colonialism headed for a climax. It was, in fact difficult to separate politics from banking; the admixture made good politics but poor banking. The political and financial might of the regional governments had helped the indigenous banks owned by them to withstand the vicissitudes of crisis and depression of the 1930s, 1940s and 1950s. Ironically, however, governments' direct involvement in banking which was a source of strength in those decades was later to constitute a source of weakness in the environment of the 1980s and 1990s.

It was in a bid to check the unintended effects of the banks' registration boom that the Banking Ordinance of 1952 was enacted. It stipulated minimum capital requirements for foreign and indigenous banks; required banks to maintain an adequate degree of liquidity satisfactory to the monetary authority; and provided for bank examination and supervision. This marked the first attempt to regulate banking practice after more than half a century of banking in Nigeria. It is noteworthy that inspite of the high failure rate at this period, the ability of the few indigenous banks to survive the worst period of banking crisis in Nigeria served as some form of catalyst in the development of indigenous entrepreneurship both in commerce and industry in the post-independence era.

2.2 Commercial Banking in Nigeria Since 1959

By 1958 when the Central Bank of Nigeria was established, Nigeria had operated banking services for about 66 years without a central regulatory body for the financial system. The commencement of operations by the Central Bank of

Nigeria (CBN) in 1959 therefore marked a turning point in Nigerian banking. A total of 12 commercial banks had survived the financial turmoil and depression up to 1960. With the ensuing regulation and supervision of banks by the CBN, the task of harnessing the activity of banks for national development had begun.

Against the background of the banking crisis of the 1950s, the major objective of the regulatory authorities at the dawn of the 1960s was to protect depositors and restore confidence in the banking system. This was the beginning of what is today referred to as the control regime. Spurred by the strong desire to completely rid the system of any vestiges of the laissez-faire era, the government, during the period amassed enormous powers for itself in banking matters. The central objective was to redirect commercial activities of former colonial masters to national development programmes. Before then, the foreign-owned banks which were predominant were operating like subsidiaries of their parent bodies overseas. They invested actively in the developed financial markets, particularly in their countries of origin.

The policy of domesticating the nation's financial markets which was initiated by the CBN took the form of the introduction of money market instruments such as treasury bills, call money scheme and produce bills. The impact of these was positive and therefore encouraging to the monetary authorities. By 1962, for instance, total investments by commercial banks in overseas markets dropped sharply from the equivalent of over three million naira in 1960 to less than a million naira. On the other hand, their investments in Nigeria rose by the equivalent of nearly N13 million between 1960 and 1962.

The same positive trend was noticeable by way of considerable physical expansion in the banking system. By 1965, the number of commercial banks had grown from 13 in 1960 with total branch offices of 192 to 15 with a total branch network of 240 (Table 2.3). A noticeable trend that later became a crucial policy issue for the CBN was however the high concentration of banks in urban areas which

accounted for about 80 per cent of total branch offices in 1962.² The disparity in growth rates between rural and urban bank branches continued and by the end of the decade, the proportion of bank offices located in urban and semi-urban areas (those having a population of 20,000 people or more) rose to about 85 per cent while the ratio of rural branches declined to about 15 per cent. The urban bias was more pronounced among expatriate banks compared with the indigenous state government banks. For instance, up to early 1970s, four of the seven operating foreign banks had no rural branch offices. This reflects their original objective of catering for the banking needs of expatriate businesses which were concentrated in the cities.

The presumption that expatriate banks were less inclined to implement pro-developmental policies could have informed the promulgation of the Companies Act, 1968, which was designed to strengthen government's control of the activities of banks. The Act required all foreign owned companies operating in Nigeria to incorporate locally under the new Company Law. In compliance with the requirements of the Act, expatriate controlled banks registered as Nigerian companies. The Nigerian Banking Decree (1969) had further laid down the basic regulatory framework for banking operations and firmly established the controlling authority of CBN over banks. The Decree has been replaced by the Banks and Other Financial Institutions Decree (BOFID) which was introduced to allow necessary regulatory flexibility required in a deregulated financial market. In 1969 also CBN issued the first Monetary Policy Circular which has since become an annual policy document for monitoring and supervising banking operations in Nigeria.

Of particular importance in terms of operational development is the considerable improvement in the growth of commercial banks over the first decade post independence. Total assets, for instance, grew at an average of 14.6 per cent between 1961 and 1969 while loans and advances which accounted for 31.9 per cent

² This concentration in the regional spectrum is essentially due to efficiencies; even though it goes against naive development schemes. Same is reflected in the financial services industry in developed countries. London, New York, Chicago, Frankfurt and Paris are good examples of such tendencies.

of aggregate bank assets in 1962 expanded by an average of 9.9 per cent over the same period. Commercial banking also grew in importance in terms of contribution to macro-economic aggregates. The ratio of commercial bank deposits to Gross Domestic Product (GDP) rose from 6.15 per cent in 1961 to 13.24 per cent in 1969.³ Also, the ratio of demand deposits to money supply rose from 36.7 per cent in 1961 to 42.5 per cent in 1969. Thus, it could be readily concluded that by the end of the 1960s decade, commercial banking, both in terms of statutory regulation and operational relevance to the developmental aspirations of Nigeria as a nation-state, had come of age.

The idea of directed credit was later introduced in the monetary policy circular, as the share of the preferred sector from the total bank credit was continuously increased while a requirement that a minimum percentage of all loans be made to indigenous businesses was also introduced. Minimum and maximum targets were set for bank credit across several economic sectors and sub-sectors broadly grouped under preferred and less preferred sectors.

The major objective of this policy was to redirect the flow of bank credit from purely commercial to productive activities. This was particularly underscored by the experiences of the 1960s when on the average the proportion of commercial bank credit allocated to general commerce was over 61 per cent of the total loans and advances. Although the situation improved gradually over the years, as at 1969, the proportion of credit to general commerce was still predominant at over 52 per cent of total bank lending while the production sector accounted for about 28 per cent (Table 2.2).

By 1973, the ratios had drastically altered to 38 per cent for the productive sector and 35 per cent for general commerce. This trend continued over the years and in 1980, commercial bank credit to the productive sector had climbed to N3,795.3 million or about 59.8 per cent of total credit. On the other hand, general commerce

³ We could also use Goldsmith's Financial Intermediary Ratio here as an index of financial development as was used in Koh (1989).

Table 2.2: Distribution of Commercial Banks' loans and Advances (N Million)

Year	CATEGORY OF BORROWERS								Total
	Production	%	General Commerce	%	Services	%	Others	%	
1966	71.0	23.8	183.4	61.6	11.4	3.8	32.3	10.8	298.1
1970	115.9	33.0	167.5	47.7	19.7	5.6	48.2	13.7	351.3
1975	677.1	44.0	504.3	32.8	150.6	9.8	205.9	13.4	1,537.9
1980	3,795.3	59.8	1,209.3	19.0	573.4	9.0	771.1	12.2	6,349.1
1985	7,272.2	59.8	2,051.3	16.8	987.7	8.1	1,859.0	15.3	12,170.3
1989	13,640.5	61.4	4,222.3	19.0	1,022.0	4.6	3,336.5	15.0	22,221.3
1990	15,678.5	61.2	4,529.8	17.6	1,151.0	4.5	4,333.5	16.9	25,692.8

Source: Central Bank of Nigeria, Economic and Financial Review, various issues.

accounted for about 19 per cent of total commercial bank credit in that year. There was a slight fall in the share of the productive sector in 1986 when it accounted for about 56 per cent while that of general commerce decreased to 17.5 per cent. This was attributable to the growing emphasis on export financing at the time.

As part of the decontrol measures which started in the second half of 1986, the rigid allocation of commercial bank loans gave way to a broad classification into 'high priority' and 'other sectors'. The high priority sectors which consist of agricultural production and manufacturing enterprises are allocated 50 per cent. The 50 per cent allocation to the high priority sectors is shared 15 per cent to agricultural production and 35 per cent to manufacturing enterprises. The performance of commercial banks in this respect has improved substantially in the recent past. The structure of commercial banks' loans and advances in 1987 showed a short-fall of 9.1 per cent from the prescribed 50 per cent allocation to the high priority sectors. The shortfall so far has been entirely accounted for by allocation to manufacturing enterprises. This is not unconnected with the unimpressive performance of the manufacturing sector due to its heavy dependence on imported inputs. However, the share of the high priority sector of bank loans and advances has continued to grow. The shortfall in the allocation to the high priority sectors dropped to 4.0 percent in 1989 and further to 3.8 percent in 1990. In 1991, the banks complied fully with the requirement.

One other key development in terms of official involvement in banking in the early 1970s was the promulgation of the Nigerian Enterprises Promotion Decree (NEPD) of 1972 under which the Federal Government also exercised the right to appoint chairmen of boards of directors of the three largest banks - First Bank, Union Bank and United Bank for Africa. The NEPD was amended in 1977 and the Federal Government extended its equity holding in alien controlled banks from 40 to 60 per cent.

The CBN also strengthened its grip on the banking system through the introduction of a number of policy measures for direct and indirect regulation of banks by intensifying its use of Monetary Policy Guidelines. Both exchange and

interest rates were, for instance, officially pre-determined in an inflexible manner. A few other financial instruments such as Stabilization Securities and Bankers Unit Fund were also introduced for regulating bank liquidity.

One of the government's most ambitious and relatively successful programmes at this period is the Rural Banking Scheme which commenced with 18 banks in 1976. This was a design to rectify the anomaly being witnessed in the spatial distribution of bank branches. The concentration of banks in urban areas had, in fact, reached an alarming proportion at this period.

By 1980, the number of banks increased to 20 and the total number of branch offices stood at about 800. By the end of 1986, the number of commercial banks in the system expanded to 28 with a total branch network of 1,297. Thereafter, the banking industry entered the period of unprecedented physical expansion following the liberalization of entry restrictions (Table 2.3).

Table 2.3: Growth of Nigerian Commercial Banks: 1960-1992

Year	Number of Banks	Number of Bank Offices	Total Assets (N' Million)
1960	13	192	238.8
1965	15	240	434.3
1970	15	273	1,152.0
1975	17	445	4,308.0
1980	20	779	16,340.5
1985	28	1,297	31,997.9
1989	47	1,844	64,874.2
1990	58	1,939	82,957.9
1991	65	2,023	117,558.0
1992	65	2,269	181,736.1

Source: Central Bank of Nigeria, *Economic & Financial Review*, various issues.

By the end of 1988, the number of commercial banks had expanded to 40 with a total of 1,655 branch offices. Additional seven commercial banks were licensed in 1989, bringing the number to 47 with a total network of 1,844. Commercial banks operating in Nigeria and their number of branches are shown in Table 2.3.

Indeed, a success rate of 100 per cent was recorded for the first phase of the rural banking scheme as all the 200 rural branch offices allocated to the participating commercial banks were opened promptly. The target set for the second phase was almost fully achieved as only three branch offices allocated to one bank were still outstanding by the end of 1989. The same high success rate was achieved during the third phase as almost all the 300 branches allocated had been opened by mid-year 1989. By December 1989 there were only 10 outstanding branches to be opened (Table 2.5).

The performance of commercial banks can be further analysed from the trend in the main elements of the flow of funds for the consolidated commercial banking sector. The combined assets and liabilities of all commercial banks rose more than 102 times from the lowly sum of N1,152.03 million in 1970 to N117,558.0 million in 1991. From the liabilities side of the flow of funds table, capital and reserves had more than doubled by 1975 from N57.48 million in 1970 to N127.25 million. This rose to N389.1 million in 1980 and in 1986, the capital account amounted to N1,298.7 million. In 1989, the capital stock stood at N2,692.3 million and rose to N3,712.7 million in 1990. However, whereas capital stock accounted for roughly 5 per cent of total liabilities in 1970, this ratio deteriorated continuously from 1974 and amounted to 3.3 per cent by 1986. By the end of 1989, the ratio improved to about 4.2 per cent. At about 4.5 percent, the ratio also improved marginally. Balances held for other banks expanded from the very modest sum of N13.3 million in 1970 to N35.3 million in 1975 and further to N170.7 million in 1980. In 1986, balances from other banks jumped from only N310.4 million in 1985 and stood at N1,211.6 million in December 1989. Since mid 1990, however, there has been a remarkable decline in this item due to a significant drop in the holdings of foreign banks and overseas branches and offices of Nigeria. In 1990, total balances from other banks declined by more than

**Table 2.4: Commercial Operating in Nigeria and Number
Branches as at December 31st, 1989**

S. No.	Name of Bank	Year Established	Number of Branches
1.	Access Bank	1989	1
2.	African Continental Bank	1947	119
3.	All States Trust Bank	1988	1
4.	Allied Bank	1969	62
5.	Bank of Credit & Commerce International	1979	45
6.	Bank of the North	1959	89
7.	Chartered Bank	1988	1
8.	Commerce Bank	1989	2
9.	Commercial Bank (Credit Lyonnais)	1983	9
10.	Commercial Trust Bank	1989	2
11.	Co-operative and Commerce Bank	1961	56
12.	Co-operative Bank	1953	54
13.	Co-operative Development Bank	1986	3
14.	Eco Bank	1989	1
15.	Eko International Bank	1987	2
16.	First Bank	1894	269
17.	Ganji Bank	1981	5
18.	Habib Bank	1982	20
19.	Highland Bank	1988	1
20.	Inland Bank	1988	1
21.	Intercity Bank	1987	1
22.	International Bank for West Africa	1959	95
23.	Lion Bank	1987	4

Table 2.4 Continued

S. No.	Name of Bank	Year Established	Number of Branches
24.	Lobi Bank	1983	15
25.	Merchantile Bank	1971	35
26.	National Bank	1933	114
27.	New Nigeria Bank	1970	59
28.	Nigeria International Bank	1984	10
29.	Nigeria-Arab Bank	1962	38
30.	Nigeria Universal Bank	1972	24
31.	North-South Bank	1988	1
32.	Orient Bank	1987	5
33.	Owena Bank	1981	22
34.	Pan African Bank	1971	30
35.	Premier Commercial Bank	1987	6
36.	Progress Bank	1982	38
37.	Union Bank	1914	239
38.	United Bank for Africa	1912	180
39.	Wema Bank	1945	50
40.	Universal Trust Bank	1985	13
41.	Savannah Bank	1960	63
42.	Societe General Bank	1977	33
43.	Tropical Commercial Bank	1984	10
44.	Trade Bank	1988	1
45.	Trans International Bank	1988	1

Source: Redasel, Nigerian Banking, Finance and Commerce

53 per cent over the level in 1989 to stand at N565.2 million.

Deposits which are the major source of funds for banks accounted for the bulk of the increase in bank funds. By 1975, for instance, total deposits had grown more than four folds from N625.7 million in 1970 to N2,839.18 million. In 1980, total deposits of commercial banks amounted to N10,009.1 million and rose by N8,128.5 million or 81.2 per cent to N18,137.6 million in 1986. In December 1989, total deposits stood at N27, 164.9 million. As at September 1991, commercial bank deposits had jumped by N9,753.1 million over the level in December 1990 to hit N48,528.7 million. However, while deposits accounted for 56.66 per cent of total liabilities in 1970, the ratio declined to 45.83 per cent in 1986, a drop from over 61 per cent in 1980. This further declined to 41.9 per cent in 1989. In 1990, the ratio bounced back to 46.99 per cent. 'Other liabilities' expanded to 47.59 per cent of total liabilities in 1986 from 38.9 per cent in 1970. In 1989, this item amounted to N31,986 million or 49.3 per cent of total liabilities. By the end of 1990, 'other liabilities' had expanded to N36,840.2 million or 44.64 percent of total liabilities. Deposits and 'other liabilities', therefore accounted for the rapid growth of commercial banks' funds and represented about 91.63 per cent of total liabilities in 1990 (Table 2.6).

On the asset side, the major items in the application of funds are loans and advances, investments and 'other assets'. Each of these items recorded a phenomenal growth over the period, but there was a relative decline in the proportion of the three items in the total assets from 94.2 per cent in 1970 to 84.47 per cent in 1978 and further to 76.21 per cent in 1986. The asset structure thus altered in favour of liquid assets during this period. In 1989, however, this ratio again improved to 83.8 per cent and further to 84.61 percent in 1990 as can be seen from Table 2.7.

Loans and advances expanded from only N351.35 million in 1970 to N1,537.33 million in 1975 and rose more rapidly to N6,379.2 million in 1980. In 1986, the volume of loans and advances amounted to N15,701.5 million and by 1989, this had reached N22,221.3 million. By the end of 1991, commercial bank loans and advances totalled N31, 762.4 million. The relative importance of loans and advances grew over the period from 30.5 per cent of total assets in 1970 to 39.67 per cent in 1986.

Table 2.5: Rural Banking Programme: Allocation of Branches and Compliance
By Commercial Banks as at December 31st, 1991

S. No.	Commercial Banks	1st Phase			2nd Phase			3rd Phase			Total		
		A	O	R	A	O	R	A	O	R	A	O	R
1.	African Continental Bank	16	16	-	19	19	-	14	14	-	49	49	-
2.	Allied Bank	6	6	-	7	7	-	11	11	-	24	24	-
3.	Bank of Credit and Commerce International	-	-	-	6	6	-	16	16	-	22	22	-
4.	Bank of the North	6	6	-	19	19	-	14	14	-	39	39	-
5.	Commercial Bank (Credit Lyonnais)	-	-	-	-	-	-	5	5	-	5	5	-
6.	Co-operative Bank	5	5	-	8	8	-	9	9	-	22	22	-
7.	Co-operative and Commerce Bank	7	7	-	8	8	-	9	9	-	24	24	-
8.	First Bank	40	40	-	37	37	-	28	28	-	105	105	-
9.	Ganji Bank	-	-	-	-	-	-	5	5	-	5	5	-
10.	Habib Bank	-	-	-	-	-	-	6	6	-	6	6	-
11.	International Bank for West Africa	11	11	-	13	13	-	15	15	-	39	39	-
12.	Lobi Bank	-	-	-	-	-	-	6	6	-	6	6	-
13.	Mercantile Bank	3	3	-	6	6	-	8	8	-	17	17	-
14.	National Bank	15	15	-	19	19	-	10	9	1	44	43	-
15.	New Nigeria Bank	4	4	-	9	9	-	8	8	-	21	21	-
16.	Nigeria-Arab Bank	7	7	-	6	6	-	9	9	-	22	22	-
17.	Nigeria International Bank	-	-	-	-	-	-	5	5	-	5	5	-
18.	Nigeria Universal Bank	3	3	-	6	6	-	5	5	-	14	14	-
19.	Owena Bank	-	-	-	-	-	-	6	6	-	6	6	-
20.	Pan African Bank	5	5	-	6	6	-	5	5	-	16	16	-
21.	Progress Bank	-	-	-	-	-	-	5	5	-	5	5	-
22.	Savannah Bank	7	7	-	11	11	-	14	14	-	32	32	-
23.	Societe Generale Bank	-	-	-	6	6	-	15	15	-	21	21	-
24.	Tropical Commercial Bank	6	6	-	6	6	-	5	5	-	17	17	-
25.	Union Bank	27	27	-	36	36	-	28	28	-	91	91	-
26.	United Bank for Africa	27	27	-	32	32	-	28	28	-	87	87	-
27.	Universal Trust Bank	-	-	-	-	-	-	5	5	-	5	5	-
28.	Wema Bank	5	5	-	6	6	-	6	6	-	17	17	-
	Total	200	200	-	266	263	3	300	293	7	766	756	10

Source: Central Bank, Annual Report and Statement of Accounts, 1991.

Notes: A = Number of branches allocated; O = Number opened; and R = remaining number of branches.

Table 2.6: Deposit Liabilities of Nigerian Commercial Banks (N Million)

Year	Demand Deposit	Time Deposit	Savings Deposit	Total
1970	289.0	207.0	129.7	625.7
1971	285.3	211.4	160.2	656.9
1972	336.9	256.0	201.0	793.9
1973	430.7	357.8	224.5	1,013.0
1974	720.7	686.5	286.7	1,693.9
1975	1,266.8	1,051.1	521.3	2,839.2
1976	2,185.2	1,270.0	709.2	4,164.4
1977	2,980.1	1,325.0	930.1	5,235.2
1978	2,700.9	1,526.0	1,075.7	5,302.6
1979	3,265.7	2,418.3	1,283.8	6,967.8
1980	4,845.9	3,573.7	1,589.5	10,009.1
1981	4,880.9	3,816.8	1,979.2	10,676.9
1982	5,180.7	4,517.0	2,321.2	12,018.9
1983	5,855.6	5,203.6	2,879.3	13,938.5
1984	6,343.5	6,030.0	3,361.3	15,734.8
1985	7,046.2	6,851.0	3,699.9	17,597.1
1986	6,649.8	7,217.6	4,270.3	18,137.6
1987	7,998.0	9,882.0	5,206.7	23,086.7
1988	10,667.9	11,274.5	7,122.7	29,065.1
1989	10,188.0	7,739.1	9,237.8	27,164.9
1990	15,586.8	10,175.3	13,013.5	38,775.6
1991*	19,365.1	11,030.8	18,132.8	48,528.7

Source: Central Bank of Nigeria, Economic and Financial Review, various issues.

Note: * indicates figures as at september, 1992.

Thereafter, this declined to 34.3 per cent in 1989 as 'other assets' grew faster than loans and advances during the year. The de-emphasis on loans and advances has continued in the face of tight liquidity. In 1990, loans and advances constituted 34.25 percent of total assets.

Of equal interest is the fact that total investment grew absolutely from N533.98 million in 1970 to N3,114.9 million in 1980 and stood at N5,715.2 million in 1986. This, however, shows a drastic decline from its dominant position of 46.4 per cent of total assets in 1970 to 14.44 per cent in 1986. The value of investments had dropped by almost one-half in December 1986 from the preceding year's level due to massive discounting following CBN's demonetization of customers' pre-import deposits awaiting foreign exchange cover earlier in August. This experience was repeated in 1989 when total investments dropped from N10,376.2 million in February to N4,606.4 million in December representing a record low of 7.1 per cent of total assets, as banks sought to replenish funds lost in a drastic liquidity squeeze involving the withdrawal of public sector deposits from banks. The relative financial stability experienced in 1990 enabled banks to expand their investment portfolios once more. This rose to N11,099.4 million in the year, representing 13.38 percent of total assets. On the other hand, 'other assets' which accounted for 17.3 per cent of total assets in 1970 improved its position to 22.1 per cent in 1986 and jumped to 42.44 per cent in 1989. In 1990, other assets formed about 40.16 percent of total assets.

It is worthy of mention that the period between 1970 and June 1986 was the climax of regulatory banking in Nigeria as the regulators became highly inclined to the use of strict regulation in many instances. Where the measures failed to achieve their intended goals, regulations were usually intensified and rather than incentives, penalties were imposed to enforce compliance. This clearly demonstrated government's seemingly overzealous pursuit of its ambitious development programmes. It also reflected the basic feature of the prevailing protectionist policy framework at the global level at that time.

The performance of commercial banks highlighted above was therefore achieved in an environment of near total official control of banking. Added to this

Table 2.7: Growth of Commercial Banks' Principal Assets (N Million)

Year	Loans & Advances	Investments	Other Assets	Total Assets
1970	351.4	534.0	199.5	1,152.0
1975	1,537.3	832.0	926.2	4,308.0
1980	6,379.2	3,114.9	4,454.1	16,340.5
1981	8,604.8	2,350.2	6,277.3	19,477.5
1982	10,277.0	3,406.9	6,353.1	33,661.8
1983	11,100.0	5,730.4	7,607.5	26,701.5
1984	11,503.5	9,237.8	7,456.7	30,006.8
1985	12,170.3	10,875.8	7,349.3	31,997.9
1986	15,701.5	5,715.2	8,731.8	39,578.8
1987	17,531.9	8,714.7	16,724.6	49,828.4
1988	19,852.3	10,310.0	19,638.2	59,226.2
1989	22,221.3	4,606.4	27,533.0	64,874.2
1990	25,782.8	11,099.4	33,312.4	82,957.9

Source: Central Bank of Nigeria, Economic and Financial Review, various issues.

is the fact that most of the banks in the system were government banks, factors which hardly allowed the banks any discretion to operate on purely economic and commercial considerations. The ensuing rigidity proved rather a disincentive to banks which were constantly in breach of the set sectoral targets. While government intervention did achieve desirable changes in the pattern of commercial banking in Nigeria in many instances there is little doubt that commercial banks could have done much better without direct official involvement and rigid regulation of banking operations which often bred distortions and created room for inefficiency and circumvention. Nevertheless, commercial banks have remained the largest single group of financial institutions in the economy accounting for over 80 per cent of total institutional deposits. Their combined assets of N64,874.2 million in 1989 constituted over 72 per cent of total assets of the entire banking sector.

The dominant position of the three largest banks; First Bank of Nigeria, Union Bank of Nigeria and United Bank for Africa in the Nigerian market has been challenged over the years, though the three are still indisputably the largest commercial banks in Nigeria. There was a time the 'big three' controlled over 70 per cent of the total assets and total credit of commercial banks. Since the beginning of the 1980s, the situation has changed drastically. For instance, in 1982 the 'big three' banks controlled only 40.59 per cent of commercial banks' total assets. By 1986, a marginal reduction to 40.37 per cent was recorded. The decline continued in 1987 and reached an all time low of 34.56 per cent in 1988 as competition intensified. The ratio however rose sharply to 39.59 per cent in 1989 (Table 2.8) as several drastic liquidity measures shook many small banks in that year.

The market share of the 'big three' in deposit liabilities stood at 68.18 per cent in 1982, fell to 67.4 and 67.25 per cent in 1984 and 1985 respectively but increased marginally to 68.26 per cent in 1986 (Table 2.9). The decline continued in 1987 and hit lowest level of 59.82 per cent in 1988. In 1989, however, the 'big three' accounted for as much as 80.62 per cent of total deposits as they were less affected by the massive withdrawal of government-related deposits from banks as ordered by the monetary authorities.

Table 2.8: Commercial Banks' Total Assets: Share of the 'Big Three' Banks (N Million)

Item	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
a) Total of all Commercial Banks	22,661.8	26,701.5	30,006.8	31,997.9	39,578.8	49,828.4	59,226.2	64,874.2	82,957.9	117,558.0
b) Total of the Big Three Commercial Banks	9,199.0	11,312.0	12,432.0	14,226.0	15,981.0	18,181.2	20,468.7	25,683.8	30,407.7	42,521.3
c) Ratio of (b) to (a) in %	40.59	42.36	41.34	44.59	40.37	36.49	34.56	39.59	36.65	36.2

Source: 1. Computed from Annual Report and Accounts of Banks, various issues.
2. Central Bank of Nigeria, Economic and Financial Review, various issues.

Table 2.9: Commercial Banks' Total Deposits: Share of the 'Big Three' Banks (N Million)

Item	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
a) Total of all Commercial Banks	12,018.9	13,938.5	15,734.8	17,597.1	18,137.1	23,086.7	29,065.1	27,164.9	38,775.6	48,528.7
b) Total of the Big Three Commercial Banks	8,195	9,786	10,613	11,834	12,346	14,127.0	17,386.6	21,900.1	24,907.9	38,334.6
c) Ratio of (b) to (a) in %	68.18	70.21	67.4	67.25	68.26	61.19	59.82	80.62	64.24	78.99

Source: 1. Computed from Annual Report and Accounts of Banks, various issues.
2. Central Bank of Nigeria, Economic and Financial Review, various issues.

The most significant reduction in the market share of the 'big three' occurred in loans and advances. Their share of total loans and advances which stood at 45.28 per cent in 1982 dropped sharply to 33.46 per cent in 1986 (Table 2.9). This reached the lowest point of 32.61 per cent in 1986 before improving again to 35.22 per cent in 1989. The downward trend resumed once more in 1990 with a marked drop to 24.85 per cent and further to 22.30 percent in 1991.

Price distortions which the prevailing interest rate structure had caused by subsidising borrowers and discouraging savings, the severe restrictions of commercial banking activities and restricted entry into the banking industry remained the major unsettling issues that had begun to call for urgent reforms as from the early 1980s. The desired response, however, did not come until the second half of 1986 when deregulation was initiated.

2.3 The Economic and Financial Environment: 1980 - 1991

The year 1980 was the height of Nigeria's economic prosperity before the sharp decline in 1981. In that year, the country earned a total export revenue of \$25,962 million, recorded a balance of payments surplus of N2,402.2 million and achieved a 5.34% growth in GDP. External reserves rose by 78.94% in 1980 to stand at N5,655 million. Up till the end of 1991, the external earnings record of 1980 remained the highest in the country's earnings profile.

External revenue dropped to \$18,046 million in 1981 and dipped further to \$12,932 million in 1982. The slump was accounted for by significant declines in production and sales of crude oil in the face of glut in the oil market which began at the time. The decline has since continued. In 1992, the total projected external revenue of \$10,412 million was viewed in financial circles as too optimistic. Balance of payments swung into deficit in 1981 with a negative balance of N3,036.8 million thus exceeding the previous years surplus. The import restrictive measures adopted in 1982 under the Economic Stabilisation measures of the government of Alhaji Shehu Shagari helped to reduce the balance of payment deficit by more than 50% to N1,398.3 million in the year. GDP declined by 8.39% and 3.2% in 1981 and 1982

Table 2.10: Commercial Banks' Total Loans and Advances: Share of the 'Big Three' Banks (N Million)

Item	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
a) Total of all Commercial Banks	10,300.3	11,100.0	11,503.5	12,170.3	15,701.6	17,531.9	19,852.3	22,221.3	25,782.8	31,762.4
b) Total of the Big Three Commercial Banks	4,664	4,534	4,490	4,377	5,254	5,718.0	6,490.4	7,827.3	6,407.7	7,083.3
c) Ratio of (b) to (a) in %	45.28	40.84	39.03	35.96	33.46	32.61	32.69	35.22	24.85	22.30

Source: 1. Computed from Annual Report and Accounts of Banks, various issues.

2. Central Bank of Nigeria, Economic and Financial Review, various issues.

respectively. Also, external reserves fell by 54.2% in 1981 and 58.3% in 1982. Further clouding the outlook for the economy were rapid growth in external debt and debt service obligations.

The persistence of these adverse movements in the major macro-economic variables and the almost insignificant contributions to GDP of the manufacturing sector confirmed to policy makers that the Nigerian economy was facing a structural macro-economic disequilibrium. Hence, financial policies were unable to respond adequately to the changed domestic and external economic conditions. Consequently, a Structural Adjustment Programme (SAP) was introduced in July, 1986 aimed at redesigning economic and financial policies to redirect economic activity especially in line with the changed circumstances.

Financial sector reform constitutes the central plank of the economic restructuring programme. Key macro-economic adjustment tools such as interest and exchange rate reforms have been implemented, entry restrictions into the financial markets, particularly the banking industry has been liberalised and public sector rationalisation and privatisation has also been undertaken. These far reaching measures have severely changed the nation's economic and financial landscape.

Deregulation has afforded financial institutions greater operating freedom. Institutional barriers among various groups of financial services firms have been lowered in many respects. For instance, commercial banks were admitted into the equipment leasing market in 1990. Prior to that year, only merchant banks were permitted to engage in leasing business. For the first time in the same year, the first commercial bank to be allowed into investment banking activities was registered by the Nigerian Securities and Exchange Commission (NSEC). Some innovative approaches have equally been adopted to extend the freedom gained through the greater flexibility of the regulatory framework. These include the opening of merchant banking subsidiaries by the large commercial banks and the use of subsidiary non-bank financial houses by both commercial and merchant banks to extend the frontier of their operations.

Liberalisation of entry restriction has created a tough competitive environment

for banks and other financial intermediaries. Compared with the 40 commercial and merchant banks operating at the beginning of the reforms in 1986, the number nearly trippled to about 120 at the end of 1991. The rapidity of the expansion against the background of the depressed state of the real sector (the industrial sector has been operating at well under one-third of installed capacity) has led to predictions of an imminent shakeout within the industry. This is yet to happen but there are clear signs of financial distress among a growing number of banks.

Stiff competition for deposits under tight monetary policy and drastic liquidity curbs have raised money market rates well above prospective rates of returns in the capital market. In 1991, share prices were also outpaced by naira depreciation at the ratio of 1:1.90. Consequently, new investments have tended to flow away from the real sector in favour of short-term money market transactions. The resulting financial instability, reduced domestic output, rising inflation and more fundamentally, the sorry state of infrastructural facilities have considerably dimmed the prospects for an economic turnaround in the short-term.

2.4 Practical Regulatory Rules for Nigerian Banks in the 1980s

Within the first half of the 1980s, tight controls on banking activities which were intensified in the 1970s reached their climax. While the main objective of regulation in the 1970s was to involve banks in developmental roles in the economy, the main focus in the 1980s shifted slightly to tackling the problems emanating from the external sector in the face of economic decline. There was a greater reliance on direct and unorthodox credit controls, particularly, strict allocation of banks loans and advances and exchange control measures.

Consequently, the share of the preferred sectors (Agriculture and manufacturing) of total bank credit was continuously increased as a strategy to arrest the decline in domestic production. The allocation to the government sector also grew as the fiscal problems of the government worsened. In 1982, for instance, the allocation to the government sector was increased from 2% to 3% while the share of the export sector was reduced from 5% to 3%. However, the fixed interest rate

structure in place then stipulated lower lending rates for the preferred sectors than the less preferred. This was a big discouragement to the banks and expectedly accounted for the large scale circumvention and consequent unattainment of the sectoral targets.

As macro-economic problems intensified into the 1980s, greater and more stringent control measures were introduced. Penalties for noncompliance with various policy measures became more frequently imposed and strictly enforced. Where regulations had previously failed to achieve their intended objectives, such as in exchange controls, regulations were further intensified and more severe penalties imposed.

The main regulation introduced to address the problem of domestic inflation was a ceiling on bank credit expansion. In 1984, the permissible growth rate of aggregate bank loans and advances was reduced by one-half from 25% in 1983 to 12.5%. This followed the sharp increase in the domestic inflation rate from 7.7% in 1982 to 23.2% in 1983, the first double digit inflation rate in many years. This, plus the build-up of large external payment arrears which doubled from N2.2 billion in 1982 to about N4.4 billion in 1983, made the reduction of demand pressures in the economy the central objective of monetary and regulatory policy.

By the mid 1980s, a large part of the detailed regulatory requirements had become difficult to police. The sectoral allocation of bank credit was a typical case. Owing more to the difficulties encountered in monitoring banks' compliance than recognition of the need to allow banks some initiative and flexibility in credit decisions, the sectoral and sub-sectoral classification was compressed from nineteen to eight sectors. This was subsequently further compressed to two, the preferred and non-preferred sectors.

Over the years, discretionary policy became the characteristic feature of bank regulation in Nigeria. While the banks suffocated under the heat of tight regulatory framework, they were, however, compensated by the absence of competition and access to low cost public sector deposits. The environment therefore guaranteed profits for the few operating banks, reduced risk taking resulting in financial stability.

Following the economic and financial policy reforms in 1986, the above scenario completely changed. The demonetisation of pre-import deposits with commercial and merchant banks in 1986 was targeted at curbing banks' liquidity and therefore their credit creating ability amid rising domestic inflation. This resulted in liquidity shortfalls and spurred both competition and innovation in the banking marketplace. Deregulation of interest rate in 1987 and the liberalisation of entry restrictions into the banking sector further intensified the competitive pressures in the deposit side of the financial markets.

Another regulation which equally was aimed at reducing excessive loan growth was the withdrawal of offshore guarantees and domiciliary accounts deposits as collateral for naira denominated loans. Then came the withdrawal of public sector related deposits from banks in 1989 which threw many banks into severe liquidity crisis.

The considerable economic strains resulting from the financial sector reforms seriously undermined the soundness of financial institutions generally and the overall health condition of the financial system. The regulatory authorities have responded to this development through prudential reforms. Three major regulations can be mentioned in this regard. The first is the introduction of deposit insurance protection for depositors in 1989. Under this, all bank deposits are insured to the tune of N50,000 per account. The second is the introduction of strict rules on loan classification and provisioning under the Prudential Guidelines issued by the Central Bank of Nigeria. Also, capital adequacy requirements have been introduced to prevent financial insolvency among banks and financial crisis within the industry.

In spite of the firm commitment to financial deregulation, there is a great deal of hesitation on the part of Central Bank authorities to abandon direct control instruments and to establish indirect instruments. This hesitation is perhaps informed by the fear that a discontinuation of the use of direct instruments could lead to excessive credit expansion and total loss of monetary control.

However, the Bank has retained in its arsenal, direct instruments that have been found distortive. It has, in addition, adopted the use of some unorthodox indirect

instruments such as stabilisation securities and direct debits to banks which have led to sharp and sudden falls in bank liquidity and consequently wide fluctuations in interest rate. Hence, bank regulation in Nigeria had come midway between administrative controls and free market mechanism. Excessive reliance on direct instruments has continued while indirect instruments are still in their infancy.

The specifics of monetary policy from year to year has been expressed in the annual monetary policy circular published by the apex regulatory body, the Central Bank of Nigeria, now for more than 20 years. The circular is essentially made available to all operating commercial, merchant and other specialised banks as it contains specific guidelines which they are expected to observe during the course of the fiscal year. Since the CBN was empowered by the BOFID to regulate and supervise the activities of other non-bank financial institutions such as finance houses and insurance companies, a section of the guidelines has since been devoted to this class of institutions. However, due essentially to the recency of the development, the guidelines rarely go beyond the statement of returns to be submitted to the apex body and perhaps stipulation of minimum share capital and capital-asset ratios for insurance companies. The Insurance Decree specifies more explicit regulations over their operations.

The bulk of the policy initiatives hinges on the operations of banks for effectiveness. This makes supervision very critical since the authorities must ensure banks operate in line with their aspirations and expectations. In 1986, banks were expected to adopt specific prescribed interest and deposit rate structures. In addition, cash reserve requirements were specified. A cash reserve ratio defined as the ratio of a bank's cash holding to certain components of its deposit liabilities was specified. The definition of the ratio has changed with time.

The liquidity ratio has always been consistently stipulated to ensure that banks are able to meet their deposit obligations, sustain confidence and stability in the system and also modify the risk disposition of operating banks. The definition of the ratio has changed with time though within the more than 20 year period, the ratio has ranged between 25-30%. Eligible components for the computation of the ratio

have also changed as the characteristics of the financial and indeed, the broad economic system changed.

Also over this period, banks as the major sources of credit for the economy were not spared in their credit operations. Ceilings were placed on the growth of banks' credit portfolio. More than this, banks were expected to maintain a sectoral composition of credit which reflected national economic priorities. From an eighteen (18) sector/sub-sector categorisation adopted in 1986, the constant reclassification and redefinition of sectors/sub-sector finally resulted in a broad 3 sector classification from 1987. This categorises agricultural production and manufacturing enterprises as the high priority or preferred sector while the non-preferred sector comprises all other activities. Since 1986, commercial banks have been required to devote a minimum of 15% and 35% respectively of their total credit to the agricultural and manufacturing sectors respectively. By implication the non preferred sector should account for not more than 50% of each bank's total credit portfolio.

In addition to the sectoral credit allocation policy, banks are expected to devote minimum portions of their overall credit portfolio to indigenous businesses, small scale businesses and rural borrowers respectively. From a minimum credit allocation of about 75% to indigenous businesses, each bank's credit portfolio should now reflect the class of businesses as 100% beneficiaries. Small scale businesses as a group are also to benefit to the tune of a minimum of 20% of each bank's credit portfolio while for rural borrowers, their credit benefit is tied to deposit mobilised from within their rural vicinity. The 1992 monetary policy guidelines specified that of the funds mobilised from rural areas by each bank, at least 50% must be ploughed back to the same area as credit to finance productive activities.

Every bank renders mid-month, monthly and quarterly reports on these activities among others, to enable the supervisory authorities monitor adherence to these policies and assess the effectiveness of monetary policy. In addition to these credit related guidelines, policies are directed at regulating the structure of merchant banks' assets. The 1992 guidelines required this class of banks to maintain at least

20% of their total credit, medium and long-term credit with maturity of not less than three years. The share of credit of short term nature (maturing within 12 months) is to remain at a maximum of 20%.

Since deregulation, many changes have been made with respect to the contents of the monetary policy guidelines. For instance, in 1987 interest rate ceilings were removed and banks were allowed to fix both lending and deposit rates. Due to the significant rise in interest rates and the resultant high and rising inflation which threatened the real sector, the ceilings were again introduced in 1988. They have however, since been removed from 1990. Both the 1992 and 1993 guidelines specify a floor of 13.5% for savings deposits and place a ceiling not on the deposit or lending rates but on the spread defined as the difference between a bank's average cost of funds and the average lending rate. Banks' periodic returns must indicate both the average cost of funds and the lending rate to enable the supervisory authorities check their adherence to the maximum spread imposed.

As part of the changes made, elements eligible for the calculation of a bank's loan portfolio were expanded. A bank's total credit now comprise loans and advances, equipment leasing portfolio, bankers' acceptance and net inter-bank float in respect of call money, certificates of deposit, bankers' acceptances, commercial papers, bills discounted, and Naira promissory notes. In 1988, banks were permitted to own equity in companies. The regulation limits a bank's investment in any company to a maximum of 10% of its paid up capital while its overall ownership in various companies must not exceed 33%. These have been made more formal with the inclusion of similar prescriptions in section 21 of the BOFID of 1991. Each bank is equally to obtain permission expressly from the CBN before investing in any company or group of companies.

The ability of a bank to invest in subsidiaries or other companies is also hinged on the adequacy of its capital. From a simple capital ratio of adjusted capital funds to loans and advances, the supervisory authorities have fully implemented the recommendation of the Basle Committee on capital adequacy. The committee stipulates that each bank should exhibit a minimum risk-weighted capital ratio of 8%

from end of 1992. This is deemed a more realistic approach to assessing capital adequacy in the international community. As part of the complete package the authorities have also made room for revaluation reserves in banks' balance sheets. They are acknowledged as part of a bank's supplementary tier 2 capital. It is noteworthy that in 1993, in addition to the Basle capital ratio, banks were mandated to maintain a ratio of not less than one to ten (1:10) between their adjusted capital fund and their total credit. The re-introduction of the capital-asset (credit) ratio can be appreciated from the fact that the Basle Committee encouraged national supervisory authorities to impose additional capital restrictions as they may deem fit since the 8% risk-weighted capital ratio prescription is to be viewed only as the barest minimum. Perhaps more importantly it is thought that the additional ratio was introduced to constrain indirectly banks' credit growth and also their risk exposure as this was a tendency in banks for which the credit ceiling had been removed.

In 1990, the CBN prescribed prudential guidelines for asset classification and disclosure, provisioning, interest accruals and off-balance-sheet engagements. These guidelines were also designed to ensure consistency and uniformity in the treatment of banks' assets. The adoption of the guidelines indeed has had the positive effect of revealing the true quality of the assets of Nigerian banks and consequently the adequacy of their capital. Banks are now required to review their credit portfolio continuously (at least once every quarter) with a view to recognising any deterioration in credit quality. The guidelines come handy in ensuring that such reviews systematically and realistically classify banks' credit exposures based on the perceived risks of default. Operating banks are now required to reveal as part of their returns and in their annual reports, the level and composition of their performing and non-performing assets as well as the provisions made in respect of the non-performing assets. In addition, a general provision amounting to at least 1% of each bank's 'other assets' is expected to be made. It is important to note that the supervisory authorities reserve the right to disagree with a bank's assessment of the quality of certain components of its assets and consequently the associated provisions. This usually will be informed by the findings and observation of examiners during on-site

examination.

Since deregulation, the CBN has reserved the right to apportion Stabilisation Securities to banks when a mop-up of excess liquidity from within the economy is considered desirable. These are mandatory 90 - day investments. Banks have no control whatsoever over its application and management. Its pricing, volume of investment and timing are at the will of the apex regulatory authority usually acting in this regard on behalf of government. A review of the 1992 performance of the economy revealed that this so-called liquidity management process instrument forms about 95% of fiscal deficit financing in the year. The use and application of these securities is expected to be scrapped with the implementation and installation of open market operations.

The Banking examination and supervision department of the CBN has been responsible for monitoring the adherence of banks to these guidelines and prescribing penalties where returns are submitted late or guidelines are not adhered to. The department conducts both off-site and on-site examination. Averagely, each bank is examined comprehensively on-site about every 18-24 months. A separate inspection of each bank's foreign operations activities is also conducted. Based on its examination and extent of adherence to prescribed guidelines, the supervisory authorities have labelled some banks distressed and these have been placed under CBN's close surveillance as well as the watchful eye of the NDIC. The NDIC also conducts both on-site and off-site examination of each operating bank once within the same period. The NDIC receives a copy of the returns which banks make to the CBN.

From September 1, 1992, the CBN embarked upon a phased implementation of the indirect approach to monetary and credit control and removed the credit ceiling for any bank classified healthy. A bank was classified healthy if it met a number of criteria during the preceding three months. These criteria include adherence to the specified cash reserve ratio (which was simultaneously increased to 6% from 3%), specified liquidity ratio, prudential guidelines, statutory minimum paid-up capital requirement, capital adequacy ratio, and exhibited a sound management.

A bank is classified distressed if at least one of these criteria was violated at least once in the preceding three months. Such distressed banks will not benefit from the removal of the credit ceiling and will equally not be allowed to participate in foreign exchange market auctions until it was reclassified healthy.

2.5 The Nigerian Banking Industry Since Deregulation

As was mentioned earlier, the deregulation of the Nigerian financial system began with the introduction of the Structural Adjustment Programme (SAP) in July, 1986. As an essentially monetarist regime, the key role played by banks, particularly commercial banks, in the creation and allocation of credit makes them the pivot of the restructuring programme. This is due to the fact that such monetary aggregates as money supply, interest and exchange rates which are being fine-tuned in the process all reside in the banking industry.

Banks have thus assumed a greater role in resource management in the economy. Deregulation has brought with it relatively greater freedom in the operations of banks as well as challenges in terms of options available for rational responses under the new business environment. A number of key policy initiatives have particularly reshaped the environment of commercial banking in the past four years. Perhaps, the most important and far reaching of these is liberalisation of entry restrictions which has brought competition in the industry to the highest level on record.

The number of commercial banks has expanded from 28 in December 1986 to 54 in mid 1990. Other key policy measures include deregulation of the foreign exchange market and interest rates which have significantly increased the resource allocation powers of banks and eliminated some of the distortions in resource pricing. Exchange rate deregulation started with the introduction of the Second-Tier Foreign Exchange Market (SFEM) in September 1986. The market has undergone various changes and modifications in its operational procedures. The number of banks in the market had risen from about 28 in 1986 to about 103 in mid 1990 and about US\$8 million or N64 million is traded on a daily basis.

In a recent report of the Ad-Hoc Committee on Banking Policy to the General Assembly of Bank Chief Executives under the auspices of the Chartered Institute of Bankers of Nigeria (CIBN), the following policy defects, which had exacerbated market imperfections, were identified:

- (i) the limitations and constraints posed by the absence of a truly competitive foreign exchange market; and
- (ii) the continued reliance on various monetary controls, which are inconsistent with the policy of de-regulation. Notable examples are:
 - (a) the continued reliance on absolute loan growth ceilings as the primary means of controlling credit expansion; and
 - (b) the compulsory issuance of stabilisation securities.

According to the committee, these and other policy defects have discouraged the establishment of additional bank branches by existing banks, whilst encouraging existing banks to set up parallel and/or sister institutions predominantly as a means of increasing their access to Inter-Bank Foreign Exchange Market (IFEM) and thus their market share. Also, potential entrants to the industry have been encouraged to submit as many new bank licence applications as possible. The main policy recommendations of the committee were:

- (i) That the naira should become a convertible currency. In the interim the Central Bank of Nigeria should adopt the report of the Sub-Committee on Foreign Exchange Market (FEM) of the Bankers Committee which called for an immediate return to a competitive foreign exchange market system which would ensure that winners and losers emerge from the daily foreign exchange auction sessions. According to the committee, the adoption of this system, known as the **Dutch Auction** system would ensure that individual banks submit realistic bid rates as the Central Bank of Nigeria (CBN) would debit successful banks for the naira equivalent based on their bid rates. Banks that bid at very low rates would lose, while very high bids would be punished by the stipulation that all banks must sell at a uniform selling rate to be determined and maintained by Central Bank as the weighted average of the successful

bids.

- (ii) While recognising the need for CBN to control aggregate credit expansion in its effort to limit growth of money supply and thus reduce inflationary pressures, the committee felt that properly defined capital adequacy ratios and loan/deposit ratios could achieve the same objective without stifling competition amongst banks in the areas of deposit mobilisation, lending and project finance. Also, absolute loan growth ceilings tend to inhibit the establishment of new branches since no credit requests from such branches could be entertained. The adoption of market-determined ratios such as capital adequacy, loan/deposit ratios and the use of Open Market Operations (OMO) was recommended in preference to absolute loan growth ceiling as a mechanism for controlling credit growth in the economy;
- (iii) Finally, the Committee recommended an upward review of the minimum paid up capital of new and existing banks. This, it was suggested, should be dynamic to take account of inflation and exchange rate fluctuation.

Interest rates were deregulated in August 1987 such that deposit and lending rates of commercial banks became negotiable. This led to intensified deposit mobilisation efforts and careful fund matching by banks. Also, some restrictions on banking activities have been removed, thus allowing commercial banks increased scope in financial intermediation. These include the permission to make equity investments in other enterprises and the freedom to engage in equipment leasing. Some leading commercial banks have now established merchant banking arms while many others have formed subsidiary finance companies among other investments. The institutional distinction between commercial and merchant banks continues to submerge.⁴

2.6 Commercial Banking in Nigeria Since Deregulation: Any Expectation of Failure?

Interestingly, the far reaching developments highlighted above are taking place

⁴ This development suggests the emergence of universal banks in Nigeria.

at a period when the national economy is in distress and the productive sector is facing a dwindling market. A number of ad hoc macro-economic measures have therefore been introduced to moderate the economic upheavals. Some of these measures have however jolted the financial sector and by extension the real sector with the tendency towards a boomerang and counter-productive effects.

In spite of this constraining environment, however, banks have been able to demonstrate a high degree of resilience through an unprecedented product differentiation and more scientific financial engineering. Against the background of eroding real incomes and therefore a reduction in the propensity to save, savings deposit campaigns have continued to mount. Compared with less than 10 conventional borrowing instruments before deregulation, not less than 150 new products are now in the market. There are growing worries, however, that in the absence of a corresponding expansion in the productive sectors and reasonable overall growth in the economy, the observed expansion in the banking sector could become a phantom and quite unsustainable in the long-run.

Even more worrisome, perhaps, is the geographical factor in the physical expansion of banking institutions. The degree of concentration of banks in Lagos is so high that it is aptly correct to say that Lagos is over-banked while the rest of the country is underbanked. Of about 105 banks operating in 1990, only about 26 of them are based outside Lagos. Yet, those few are run more or less from Lagos. This development presents a far greater problem than the sheer number of banks in the market. It indicates little direct involvement of banks in the developmental efforts in other areas outside Lagos, particularly in rural areas. This situation has been further compounded by the prevailing policy of bank licensing which tilted in favour of merchant banks, which, as wholesale banks, are essentially "city" banks. Consequently, the signs are already there that this group of banks would be under severe pressures soon. In a relatively crowded market, such as we now have, and in the absence of substantial economic growth, city business would hardly be sufficient to sustain all the banks. Survival and growth will then depend on ability to explore opportunities in other areas of the country. In this regard, commercial banks, through their branch

network, have far greater chances of weathering the storm generated by competition than any other group of banks in the country today.

It is however pertinent, at this stage, to note that threats of bank failures have come not so much from the general effects of deregulation but from management problems, fraud and forgeries, poor loan recovery record, capital inadequacy and illiquidity, all of which could exist with or without deregulation. Many commercial banks are, in fact, in very precarious financial conditions as a result of a combination of these factors.

State government owned banks are, in particular, largely associated with these problems and are, therefore, highly vulnerable under the fierce competition and the unfolding extremely difficult business climate. This group of commercial banks dominate the list of banks that could hardly pass the criteria for Nigerian Deposit Insurance Corporation's (NDIC) viability test in 1989.

CHAPTER THREE

BANKING THEORY, BANK CAPITAL AND COMMERCIAL BANK PERFORMANCE

3.1 Introduction

This chapter reviews the relevant existing traditional literature and provides the theoretical framework for the analysis in the empirical chapters. We review various propositions in the theory of banking while some issues of specific importance are examined. Within the framework of banking theory discussed, we consider the concepts of capital and its adequacy, assessment and measurement; bank liquidity, asset quality and risk for their significant roles in the operations of banks. Clearly the essence of this is to examine a basis in theory for the identification of factors important for the continued health of a bank and to examine these factors in the light of banking in developing economies. Following this, a review of bank performance factors is carried out. It covers techniques of analysis, types of classification of banks, the performance of earlier models and their information requirements. It would appear in the discussion in this chapter that emphasis has been on capital and capital adequacy relative to other identified factors. This is explained by the peculiarities of the Nigerian situation. There has been so much worry about the capital base of Nigerian banks and one of the issues which have arisen is whether in fact this is a significant factor for the performance of these banks. Since deregulation, banks have been directed twice to beef up their capital base.

3.2 The Theory of the Banking Firm¹

According to Fama (1980), banks are financial intermediaries that issue deposits and use the proceeds to purchase securities. He suggests that there is no need to control the deposit creation or security purchasing activities of banks in order to obtain a stable general equilibrium with respect to prices and real activity. In practice, however, banks are forcibly involved in the process by which a pure nominal commodity or unit of account is made to play the role of numeraire and medium of exchange in a monetary system. Although there seems to be some consensus that banks and other financial intermediaries being firms, could be analysed with the same microeconomic tools that have been employed to analyse other industries, yet considerable divergence can be found in the approach. While Pesek (1970) and Towey (1974) describe banks as producing money by employing loans as inputs; Hyman (1972) and Melitz and Pardue (1973) describe them as producing credit with deposits as inputs. Most authors suggest that the intermediaries maximize "something" but there is no agreement on what they maximize. Some emphasize profits, others growth and yet others utility.

Benston and Smith (1976) viewed the role of the financial intermediary as creating specialised financial commodities. These commodities are created whenever an intermediary finds that it can sell them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs. They identified the following forms of financial intermediaries: The market maker who simply provides a market place where potential buyers and sellers come together, thus lowering relevant information costs, e.g. the Stock Exchange. The Stock Exchange does not create assets; it only furnishes a physical location for buyers and sellers to transact business. And without this intermediary, the task of locating a potential seller, especially the seller with the lowest reservation price, would be much more expensive.

¹ Note that this theory of banking can be labelled "a legal restriction theory under otherwise perfect market assumptions". It differs from *informational* or *frictional*, or even *agency* theories of banking (Fama, 1985; Gallagher, Forthcoming).

The second type of financial intermediation is provided by a dealer who also takes a position at his own risk in the asset transacted. A market specialist on a securities exchange is a good example of this form of intermediation.

The third type is a more complex form of financial intermediation by which new financial commodities are produced. This form is exemplified by Mutual Funds, Banks, Unit Trusts, etc, which allow individuals to purchase shares in diversified portfolios of securities, in odd amounts, for indefinite lengths of time, generally at a much lower transaction costs than could be achieved through the direct purchase of the underlying securities. This intermediary in this instance has a comparative advantage over a stock exchange in serving some particular group.

Frequently, portfolio theory has been used to analyse the behaviour of banks and other financial institutions. This approach, however, fails to take into consideration the production and cost constraints which determine the equilibrium output mix and scale size of the financial firm. Other studies conducted by Kareken (1967), Bell and Murphy (1968), Pesek (1970), Klein (1971), Towey (1974), Sealey and Lindley (1977) were based on the concept of the theory of the firm and have attempted to correct the deficiencies observed in portfolio theory.

Various measures of output have been suggested by writers such as Mackara (1975) and Benston (1972) which can be used depending on one's goal.² These include total assets, earning assets, total deposits, demand deposits, operating income etc. In all these instances, it has been noticed that there has been a lot of confusion on the interpretation of outputs and inputs in relation to financial firms; a situation that underscores the need to clearly understand the economic term 'production' in relation to the financial firm.

Frisch (1965) describes production as a process of transformation, directed by human beings which is considered desirable by some individuals. It means that certain

² More recent work on the multiproduct firm applied to banks uses further measures of output. This thesis, however, does not go as far as these newer specifications as data, etc. in Nigeria make it impossible.

goods or services (inputs) enter into a process in which they lose their identity, i.e. cease to exist in the original form, while other goods or services (outputs) are generated.

Nyong (1987) explained the transformation process for a financial firm as involving the borrowing of funds from surplus spending units and lending those funds to deficit spending units; that is, financial intermediation. The financial firm's output in a technical sense is thus a set of financial services to the firm's depositors (creditors) and borrowers.

Klein (1971) identified three major types of financial services:

- i) administration of the payment mechanism for demand deposit customers in the case of commercial banks;
- ii) intermediation services to depositors and borrowers in the case of a commercial bank or other depository institutions; and
- iii) portfolio management services.

The output of the financial firm is earning assets produced with labour, capital and loanable funds (deposits) as well as services rendered to depositors and other customers.

Baltensperger (1980) examines the various approaches and attempts so far made to model and explain the behaviour of banking firms. He finds that there are a number of rival models and approaches which have not yet been forged together to form a coherent, unified and generally accepted theory of bank behaviour. The main economic functions of financial firms, according to Baltensperger, are those of consolidating and transferring risks on the one hand, and of serving as dealers or brokers in the credit markets on the other hand. A satisfactory theory of the banking firm must take these elements into account. Baltensperger's approach is to group the models into two. In the first group are models of bank portfolio management. He describes these as 'partial' models, in the sense that the total size of the bank's portfolio of the optimal allocation of this portfolio remains to be solved. In the second group are complete models of the banking firm. These models attempt to explain the joint determination of not only the structure of assets and liabilities and

their interaction, but also the total scale of the bank's operation and portfolio.

Models relating to bank reserve (liquidity) management have dominated the scene. A typical model in this category is characterised by the assumption that the total size, as well as the structure, of the bank's liabilities are exogenously determined and not subject to optimizing behaviour, the problem to be solved being the optimal allocation of the given funds among various assets, with particular attention being paid to the choice between earning assets and reserve (liquid) assets (Baltensperger, 1980).

Apart from bank reserve and liquidity management, Baltensperger also examined the activities which are recorded on the liability side of the balance sheet. His analysis showed the desired (optimal) liability side structure (including the desired relationship between deposit liabilities and capital account).

In his view, a complete theory of the banking firm should go beyond these. It should explain not only the bank's asset and liability choices and their interaction (if any), but also the determination of the total size of the firm. Also, it should not only provide an integrated view of the firm's asset and liability choices, and allow for an endogenous determination of the total scale of operation of the firm. Thus, Baltensperger distinguished three types of models, viz: monopoly models, risk aversion models and real resource models.

In the first type a crucial role is assigned to the assumption that banks can operate as monopolistic price setters in deposit and/or credit markets. The second type places emphasis on the assumption of subjective risk aversion on the part of the bank (or its owners). He described the third type as real resource or real production aspects of banking business.

The models of optimal asset choice are models of bank reserve and liquidity management. The basic model is traced back to Edgeworth (1888) and has since been followed by various studies such as those by Orr and Mellon (1961), Porter (1961), Morrison (1966), Poole (1968), Frost (1971), Baltensperger (1972a, 1972b), Ritzmann (1973), Pringle (1974), Hester (1975), Koskela (1976), and Niehans (1978). Essentially, these models treat the bank's reserve and liquidity management decision

as a problem of inventory optimization under stochastic demand (Baltensperger, 1980).

The liability management model also applies the inventory theoretic approach to determine banks' capital account and deposits. For deposits, the modelling has been akin to the simple monopolistic structure outlined for the asset side, while for capital and leverage issues, more sophisticated techniques have been used.

Some authors including Sealey and Lindley (1977) and Baltensperger (1972b) further extended the work by integrating production costs analyses. These two models are described as partial (portfolio structure) models dealing with questions of either asset choice or liability management.

Santomero (1984) in his attempt at micro-modelling identified three approaches to the problem of why banks exist in the financial market:

- a) the role played as asset transformers;
- b) the role of banks' demand liabilities as medium of exchange; and
- c) the two-sided nature of these financial firms which he regards as critical in any explanation of their behaviour.

The asset transformation function can be further subdivided into asset diversification and asset evaluation functions of the financial firm. Klein (1971) and Benston and Smith (1976) noted that a fundamental role of intermediation is transformation of large denomination financial assets into smaller units. The banks provide divisibility services to depositors and equity holders interested in asset diversification. The second view argues that the bank is fundamentally an evaluator of credit risk. They serve as financial intermediaries whose primary role is the evaluation and purchase of financial assets (Santomero, 1984). Another argument is that because of imperfect information concerning the value of the underlying project, investors can glean some information about its quality by observing the willingness of the insider to invest equity capital in the endeavour. Accordingly, the financial structure of the firm adds information to the market. This approach was also extended to intermediation, with the central argument being that this signalling problem could explain financial intermediation. Thus, banks which gather information

become intermediaries, holding assets that are considered to be of added value, compared with when they are held separately.

A counter argument also exists which maintains that because of the uncertainty of the value of the intermediaries' information, the mere observation of the portfolio is not sufficient to resolve the signalling issue. The conclusion here is that by dedicating wealth to the firm, the owner-managers of financial intermediaries demonstrate their commitment to the portfolio and signal the value of the underlying assets. Diversification was also found to be an important characteristic in the information uncertainty equilibrium.

The second reason for the existence of the banking firm is the central role played by its demand deposit liabilities as the medium of exchange. The unique function of a monetary unit with the formalisation of the choice of monetary unit and exchange patterns has also been shown (Niehans, 1978). The central feature of a monetary unit is its ability to minimize the cost of transactions that convert income into the optimal consumption bundle (Santomero, 1984).

The common feature of the literature on the demand for money is the determination of positive money holding that are a function of transaction costs, uncertainty and relative rates of return. The monetary mechanism, along with bank pricing decisions, offer the financial firm the opportunity to attract deposits which may be reinvested at a positive spread. The extent of this profit will depend upon the nature of competition.

The third reason advanced for the existence of a banking firm centres upon the conditions necessary for banks to exist as internal financial firms. This relates to the two-sided nature of the financial firm. A model of the maximizing firm in a financial market with uncertain rates of return was developed which found that covariance between the return on loans and deposits fosters intermediation by encouraging the risk-averse maximizer to transform deposits into loans (Pyle, 1971). Sealey (1980) states that a correlation between profits and the level of rates is shown to be equally important as an explanation for financial intermediation.

Santomero (1984) also discussed asset allocation models. These are of two

types, namely, reserve management models and portfolio composition models.³ The former is concerned with the problem of the optimal quantity of primary or secondary reserves to be held by a bank that is subject to stochastic reserve losses due to uncertain deposit levels. The latter is devoted to the allocation across risky assets according to risk and return.

Reserve Management Modelling is perhaps the oldest in banking which has also been traced to Edgeworth (1888) with contributions and corrections subsequently made by Orr and Mellon (1961), Poole (1968), Frost (1971), Baltensperger (1972a, 1972b, 1974) and Ralti (1979).

Basically, the models prove that if withdrawals exceed reserves, the bank must undergo a proportional cost to obtain the additional funds. The bank, therefore, wishing to maximize expected profit from its deposit balances, must ensure that the opportunity cost of reserves, on the margin, equals the expected reduction in operating or transactions cost devoted to reserve adjustments. This is the essential condition that must be met in reserve management models. Portfolio Choice models of asset allocation take two forms: the bank is viewed as possessing some degree of monopoly control over its loan price, or the asset market is modelled as a perfectly competitive one where the bank must select appropriate quantities of loans of various characteristics.

The typical model structure is a two-sided discriminating monopoly. Marginal revenue equals marginal costs. A variation in any one market feeds through the model to a comparative static shift in all marginal conditions (Santomero, 1984). The bank is a deposit rate setter with some monopolistic control over deposit market. In such situations the marginal cost of funds from each deposit source must equal the marginal cost of funds from the competitive market. Another approach has one market as a perfectly competitive one.

The discussion of liability choice models throws a searchlight on capital decision. In the absence of frictions and taxes, there exists no optimal capital

³ These go back to Baltensperger (1980).

structure (Modigliani and Miller, 1958). Pringle (1974) showed that optimal capital is attained when the excess marginal revenue on loans equals the excess marginal cost of capital.

Kahane (1977) and Koehn and Santomero (1980) use the portfolio model approach on the bank capital issue. They optimize the bank's rate of return on capital by selecting a portfolio of assets and leverage position that optimizes shareholders' returns. They analyze the effect on bank portfolio behaviour of a regulatory shift in capital adequacy regulations. They demonstrate that although capital increases as a fraction of assets, the resultant portfolio is unambiguously more risky than before the capital constraint. Essentially, the constrained firm attempts to offset some of the effect of the leverage limit by absorbing greater risk in its portfolio than before the regulation. These results lend credence to the idea that regulation, if it is to be effective, must be combined with adequate understanding of the behavioural response of the banking firm (Santomero, 1984). The two-sided modelling which we discussed earlier was further examined by Santomero and several models have recently appeared which are related to this nature of the banking problem.

The alteration in the financial intermediation process associated with increased interest variability has been examined. It was found that the typical bank serves as both an asset-transformer and broker. The former, in the sense that it borrows funds at a fixed rate before interest rate uncertainty on the asset side is resolved, and the latter, in the sense that it borrows only after interest rates are known. Increased rate volatility therefore, shifts the bank's activity more toward a brokerage function and away from the traditional asset transformation function. The limited upside gain from higher rates is unlikely to be sufficient to compensate the bank for the reduced profit from asset transformation when rates decline. Accordingly, variability results in the shift to brokerage activity even for an expected profit-maximizing firm.

Santomero also discussed credit rationing models. Credit rationing occurs when a subset of firms seeking credit at the going rate is not granted such loan in spite of the fact that its objective characteristics are identical, or nearly so, to those firms receiving credit. This definition recognizes that some borrowers are not worthy

of credit because of loan or project characteristics and are, therefore, formally rejected by the lending institution. These models have been divided into two, viz: *equilibrium rationing* and *dynamic rationing* models. Equilibrium Rationing is such that occurs in the long run while dynamic Rationing exists in the transitory periods between such equilibria.

It has been argued, however, that because of the intertemporal and cross-product relationship between a customer and the bank, preferential treatment is given to prime customers when credit tightening occurs. Accordingly, nonprime, small customers are rationed during periods of interest rate movement. Banks in this case are seen to be merely behaving as multi-period profit maximizers by favouring their best customers.

Blackwell and Santomero (1982) have shown that if large firms, with intertemporal demands for credit and multi-periods commitments to the banking institution are priced correctly, they will, on the margin, be no more profitable than the smaller less sophisticated firm. Accordingly, if rationing becomes necessary, there is no reason to believe that they will be given additional consideration. It is also shown that large firms have higher elasticity of demand with alternative funding options, and are less likely to receive credit preference during such periods of constraint in contrast to the traditional result. Santomero (1984) questions the worth of this submission.

A third approach to credit rationing is the *information asymmetry* or *adverse selection* approach. Santomero (1984) regards this as the most promising of the three approaches. The argument is that expected value pricing of loan rates hides two different types of borrowers. That is, when all loans are priced at a single rate, the bank attracts both honest and dishonest customers. The former fully anticipates repayment, whereas the latter will renege in all states where the implied cost is lower than the repayment. An equilibrium competitive interest rate will be set so that the market rate incorporates the probability of default by the dishonest or unlucky borrower. The variations in the loan rate from this equilibrium level are shown to be capable of shifting the relative proportion of honest borrowers so as to improve the

expected profit for the financial institution. Essentially, by restricting the percentage of an investment project that is financed by the bank, the lender attracts more honest customers and a small loan loss experience.

Also demonstrated is the fact that, as the interest rate charged to borrowers increases, the percentage of low quality loans may increase. That is, without *a priori* knowledge of the quality of each loan applicant, the willingness to pay higher interest rates is a screening device in identifying high-risk borrowers. Therefore, the bank would prefer to charge a lower rate than to clear the loan market by discouraging the preferred borrowing group.

3.3 Defining Capital in the Context of Capital Adequacy Analysis

The Bank of England (1980), on the measurement of bank capital, did not include the two types of loan provisions in the computation of capital resources. Loan provisions may be specific or general, and different banking considerations apply to each, although in the accounting sense, they are essentially part of the same provision.

In the case of specific provisions, they relate to specific loans which have been classified because recovery in full is considered doubtful. Such provisions are based on subjective judgement and are regarded as inaccurate. Wesson (1985) regards this as a good ground for excluding them in the calculation of a bank's capital resources and agrees with the stand of the Bank of England on the issue. It is the practice of banks to also exclude general provisions from capital. These are provisions made to cover latent but as yet unidentified bad debts already in the balance sheet. The Bank has concluded that where it is satisfied that a general provision is freely available to absorb future losses it is appropriate to include it within the Bank's definition of the capital base. In the context of country risk debts the position has now become clearer.

In August 1987 the Bank of England issued a policy paper on debt provisioning. It introduced a system of credit scoring covering 15 characteristics to all country risk debts in the form of a matrix. The various characteristics were then

grouped into three *factors*. Scores are attached to the various factors with suggestions for the rate of provisions. For example, if interest on a loan has not been serviced for more than 3 months, it scores eight and if it is in breach of International Monetary Fund (IMF) performance criteria it scores three. Total score of 10-24 points requires a minimum provision of 5 percent; a point score of 71-83 leads to a maximum provision of 100 per cent. Then, significantly, all provisions required under the matrix calculation must be deducted from a bank's capital base for capital adequacy purposes, whether regarded as general or specific provisions.

There has also been some controversy about the relationship of deferred tax to bank capital. The consensus however appears to be that, if a company has identified that it is liable to pay tax at a future date and makes provision for such tax liability in its accounts, the provision clearly reflects a potential debt owed to government and amounts set aside for this purpose should not be regarded as part of capital resources.

Another aspect of the definition of capital which is outside the confines of the concept of equity base extends to what may be described as capital gearing. In this regard, it is necessary to examine how the capital of a bank may include terms other than the equity of the parent company or shareholders, for example, loan stock. The Bank of England (1985) stated that the function of loan stocks is not to provide a reserve against losses but to finance part of the infrastructure of the business; and that such loan stocks should be subordinated on medium or long-term. This conclusion rested on the view that loan stocks are an inadequate substitute for shareholders' funds because of their impermanence and inability to absorb losses without precipitating a liquidation. The Bank has since reviewed this approach to loan stocks in the context of the purposes for which capital is required which have been identified as follows:

- i) to provide a cushion to absorb losses;
- ii) to demonstrate to potential depositors the willingness of the shareholders to put their own funds at risk on a permanent basis;
- iii) to provide resources free of fixed financing costs;

- iv) to be a suitable form of finance for the general infrastructure of the business.

Shareholders' funds are found to be suitable for all these purposes. Loan stocks do not meet all the four conditions. For instance, they do not provide a reserve against losses for a business which continues to trade. They do not demonstrate to depositors a willingness of the shareholders to put capital at risk on a permanent basis; nor do they provide resources free of fixed financing costs. In times of low profitability, loan stocks, provided they are fully subordinated, do protect depositors against loss in a liquidation. Thus, it is agreed that while subordinated loan stocks are not a full substitute for share capital, their presence can enhance the level of protection available to depositors.

In the light of the above, the Bank of England concluded that fully subordinated loan stocks be allowed as part of capital base provided they have a minimum maturity of five years and are subject to an amortisation factor applied to loan stocks with less than five years remaining to maturity. This factor, according to the Bank is intended to discourage unduly short initial terms and to soften the impact on capital ratios when the loan capital is repaid and not re-issued. The Bank also expects that loan stocks which form part of the capital base will not have any unduly restrictive conditions attached to them which might necessitate their immediate repayment at a time when a bank can least afford it from a prudential point of view.

The difficulties arising in defining capital are threefold. First, capital must not only be looked at as a stock at a given time as stated on a balance sheet but must, according to Wesson (1985), also be seen as *the fulcrum of a continuing business and, accordingly, as a magnitude changing through time*. Hence, interpretation of trends in capital strength must centre on examination of the *path of capital through time and in particular, on shifts of the level of earnings and profitability*.

Secondly, it is necessary to determine the purpose for which the definition is required as this may create differences in approach leading to different answers. For instance, are we trying to focus attention on the net worth of the business?. Or the *free equity* described by Wesson as *that part of capital resources not regarded as pre-*

empted to cover fixed assets and thus available at need to cover the risks inherent in banking assets?. Or are we taking a broader perspective and thus include all or part of subordinated debt loan stock, so long as we distinguish between equity and debt?

Finally, are we considering the capital structure of a group of related companies? In which case the distribution of capital between parent and subsidiary becomes significant in the assessment of group capital resources.

The third difficulty highlighted by Wesson is the problem of valuation of capital. By accounting convention, assets and liabilities are measured in balance sheets on the basis of historical cost, which may be grossly inaccurate and thus give rise to a false picture if there is a marked difference between historical cost and current cost, particularly in periods of high inflation. Thus, capital as stated in published balance sheet may be unrealistic. Wesson emphasized the importance of current cost adjustment to historical cost figures and concludes that the basis of valuation of assets assumes special importance in this regard. To date, perhaps no satisfactory solution has been found to the problem of valuation of capital. And for want of a better alternative, book value remains the most promising approach to evaluate bank capital.

Having surveyed the problems of definition, the different components of capital can be examined. The equity of the shareholders is regarded as an essential part of capital resources. Wesson (1985) defined equity as the issued share capital of the bank and all reserves, other than those reflecting specific provisions for losses. Reserves include retained profits and any surpluses arising, for example, from the revaluation of assets, such as bank properties, or from transfer of provisions from loan losses judged surplus to requirements, as well as any premiums received from the sale of shares to shareholders. We agree entirely with this definition of equity which is in conformity with the position in Nigeria. Banks in Nigeria are required to maintain reserve funds called Statutory Reserves into which a fixed amount of profits must be transferred each year and before dividends are declared. The balance on the Statutory Reserve account cannot be distributed by shareholders. Thus, banks are compelled to retain a reasonable proportion of their profits which then forms part

of their capital base. The significance of the level of earnings to growth in bank capital becomes clearer from this requirement. A bank that makes good profits will not only directly strengthen its capital base but will be able to attract new capital from the market or from existing shareholders on better terms. On the other hand, low levels of earnings will make it more difficult and more expensive to raise new capital. Capacity of management to consistently generate adequate profit which tend to maintain both liquidity and confidence, contain risk and preserve the capital base. The role of capital can also be examined from three view points, viz: a) that of depositors and the monetary system; b) that of the functioning of banks as financial intermediaries; and c) that of shareholders of the bank. From the viewpoint of regulators (a) and (b) are regarded as being of major importance as they are the role of bank's capital in terms of providing the depositors and the monetary systems with reasonable protection against insolvency.

Furthermore, in discussing the role of capital, the approach of Wesson (1985) was to examine the reasons why banks need capital. As financial intermediaries, the basic function of a bank is to provide facilities for the mobilisation of savings and make the funds available for investment purposes by the process of granting credit facilities to those in need of funds. Thus, these funds are made available to businesses to enable them to expand their productive capacity and to individuals and households to facilitate consumption. To be able to perform this important function a bank must always be able to meet all its contractual obligations without delay. These include repayment of deposits and payment of maturing acceptances, which means that the bank must remain liquid at all times. When deposits are withdrawn new deposits may be raised in replacement, but a bank's ability to repay deposits will also depend on the maturity structure and value of its assets. Wesson, therefore, points out that if the maturity structure of a bank's assets is excessively long relative to the maturity structure of its deposits, it will have a negative cash flow in the sense that the inflow of cash from maturing assets will fall short of its maturing liabilities. If the bank is unable to raise new deposits to meet the liabilities, those repayments can be made only by sale of assets which will reduce the size of the bank's total assets. Such an

action can only provide a temporary solution because as assets continue to be depleted at a steady rate, a bank will eventually become insolvent. This is, however, also a function of the price of assets.

This type of dilemma can only be avoided by fostering a healthy relationship between bank capital resources and the maturity structure of assets and liabilities. Viability depends not only on depositors being confident that the maturity transformation in bank balance sheets is not excessive in relation to capital resources but also that this confidence extends to exposure to all those risks which exist in banking assets. This amounts to saying that the minimum acceptable ratio of capital to deposits of a bank will ultimately depend on the depositors' perceptions of the adequacy of capital in relation to risk (Wesson, 1985). The Bank of England also identified the following reasons why banks need capital:

- i) provision of the infrastructure of the business; and
- ii) protection of depositors from losses as a result of business risks thus engendering the confidence of potential depositors and trading partners.

It has since been established that the infrastructure of a bank should normally be covered on a one-to-one basis by capital resources and should not be financed by depositors' funds. The infrastructures of a bank include the premises, equipment, other fixed assets, trade investments, goodwill etc.

Apilado and Gies (1972) and Vojta (1973) also reduced the major functions of capital to two. The first, and perhaps more important, is the protection of depositors - creditors; the second is the provision of funds to finance operations, particularly the acquisition of fixed assets. For the majority of non-financial firms capital is used primarily to finance operations, and secondarily to provide a buffer or insurance fund to absorb possible losses. Other writers and authorities who agree with this view include Mingo (1975) and the U.S. Federal Reserve Board.

Short (1977) followed a different approach in equating the function of bank capital to that of any business, which is, to cover all the expenses in setting the business up, getting it into operation, and thereafter finance addition to its fixed

assets. He agrees that no firm, especially a bank, should use borrowed funds to get established or to acquire fixed assets, rather, these should be financed directly by the shareholders or from funds accumulated within the business.

In addition to financing its creation and subsequent acquisition of any more fixed assets, a bank should also have capital to justify the trust placed in it by depositors and to protect the economy's payment mechanism, of which its deposits are a part. Another role of bank capital, according to Short, is to absorb unexpected losses already mentioned; it should serve as a buffer to absorb only unexpected losses. It is also the role of capital to minimize the losses that depositors and other creditors will have to bear if it does fail.

The argument here is that a bank's capital should serve as a buffer against insolvency and be adequate enough to attract deposits. It should serve to establish a level of confidence in savers and depositors sufficient to induce them to invest in and deposit with the bank and thereby fund the institution in a manner adequate to enable it to conduct its business. The shareholders should be able to respond to the implicit market perception that a profit-making enterprise must have risk capital to support its operations and business. A bank's capital in this respect should serve as a demonstration to the depositors of the willingness of a bank's shareholders to put their funds at risk on a permanent basis thus serving as a cushion to absorb losses that may expose a bank to insolvency.

Depositors' losses can also be reduced through deposit insurance schemes. In fact, some authors like Kreps and Wacht (1971) argue that deposit insurance has reduced, if not largely eliminated, the importance of capital as buffer to absorb losses. The role of deposit insurance will be examined in more detail later in this review. We will only say at this juncture that we do not subscribe to the view that deposit insurance is a substitute for capital.

As has been seen, the impact of earnings on capital is quite significant. A sufficient flow of earnings is essential as a first defence against losses and as a source of new capital. In view of the fact that profitability is influenced by managerial capacity, the assessment of the overall quality of management cannot be avoided.

Profitability also has its place in the assessment of capital adequacy and a regulator's assessment of capital adequacy of a particular bank should involve qualitative judgements on the nature of its business.

Another function of capital which is usually overlooked is its use as an instrument of monetary policy in countries where bank regulations enforce a capital to deposit ratio or where bank management believes that their capital should be proportional to their deposits. Thus capital assumes the function of restraining the growth of bank deposits. Although this is not a classical instrument of monetary policy, there is some indication that capital adequacy requirements may have been employed in some countries, especially in the United States, to help to slow the growth of money supply. Leavitt (1974) listed capital adequacy requirement as a monetary policy instrument. We believe that capital adequacy requirements, like cash reserve requirements which also were designed initially to protect depositors, can be effective monetary policy instruments of general application.

It is necessary to also consider the role of capital in the determination of a bank's policy. In formulating its loan policy a bank will consider the returns, cost of funds, availability of funds and the position of capital. There is no doubt that capital plays a very important role in determining the magnitude of a bank's total loan portfolio because it represents a source of funds to the bank, along with deposits and borrowings. A bank must, therefore, consider the position of its capital before determining its policy on loans. We also find that during a period of *tight money* an under-capitalised bank may find itself in a situation where it will have to raise funds at a relatively high cost, while some of its existing loans are locked in at lower interest rates. At such times the bank's profits will be squeezed and it may well have to constrain its loans below the otherwise optimal level because of non-availability of funds at profitable margins. Conversely, an over-capitalised bank will be in a position to exploit high returns during such period, especially if it is prepared to take some risk.

The work of the Basle Committee on Banking Regulations and Supervisory Practices in respect of capital measurement and the setting of capital standards is

perhaps the most significant attempt in recent times to clarify the eligible components and composition of a bank's capital and equally ensure uniformity and consistency among banks across different countries and different economies. In the 1988 document which details minimum standards and allows for initiative from domestic monetary authorities, a risk weighted capital ratio approach to assessing capital adequacy was proposed. The selection of the approach was, from all indications greatly influenced by the need to engender uniformity in and equally strengthen the international banking system.

The Committee in defining a bank's total capital distinguishes between two categories of capital referred to as tier 1 and tier 2 capital respectively. Of these two categories, components of tier 1 capital which are viewed as having equal intra-category weights, are emphasised over and above components of tier 2 capital. This can equally be appreciated from the restriction that tier 2 capital an eligible component of a bank's total capital, cannot exceed tier 1 capital. The reverse position is, however, encouraged. The Committee essentially considers a bank's equity capital and reserves which comprise tier 1 capital in the scheme, to be the key elements of capital upon which emphasis should be placed. This is due to the fact that these elements are the only ones common to all countries' banking systems. They are visible in the published accounts and form the basis on which most market judgements of capital adequacy are made and they have crucial bearing on profit margins and any bank's ability to compete (Basle, 1988).

Other elements of capital are admitted into tier 2 up to an amount equal to that of tier 1 capital also referred to as 'core capital'. The major eligible components for tier 2 or supplementary capital include (i) undisclosed reserves, (ii) revaluation reserves, (iii) general provisions/general loan loss reserves, (iv) hybrid debt capital instruments and (v) subordinated term debt. According to the Committee, each of these elements may be included or excluded by national supervisory authorities at their discretion in the light of their national accounting and supervisory regulations. The unpublished or hidden reserves as the name suggests refer to only reserves which, though unpublished, have passed through the profit & loss account and

perhaps more importantly, which are accepted by the bank's supervisory authorities. The Committee realised the possibility that such reserves may be inherently of the same intrinsic quality as published retained earnings but is more disposed towards its exclusion as a core capital element since many countries hardly recognised such reserves. They seem to lack transparency and this may not be appropriate in the context of setting widely applicable international minimum standards.

The revaluation reserves are important for banking systems which allow banks to revalue certain assets to reflect their current value, or at least something closer to their current value than historic cost. Such systems even consider such revaluation reserves to be eligible components of a bank's capital base. It is however, demanded that where such reserves are to be considered as part of supplementary tier 2 capital, the authorities must ensure that the assets are considered to have been prudently valued, especially fully reflecting the possibility of price fluctuations and forced sale. The Central Bank of Nigeria has since implemented this provision as part of the larger Basle capital adequacy scheme. General provisions/general loan loss reserves qualify for inclusion in tier 2 capital if they are not set aside to take care of particular assets and do not reflect a reduction in the valuation of particular assets. Perpetual preference shares carrying cumulative fixed charge are considered part of hybrid debt capital instruments. Perpetual debt instruments in the United Kingdom and mandatory convertible debt instruments in the United States are also examples of qualifying components. In the case of Nigeria, convertible fixed rate debentures will also qualify for inclusion. Finally, subordinated term debt with a minimum original term to maturity of over five years may be included within the supplementary capital elements and in fact subject to adequate authorisation arrangements.

Some deductions are also to be made from a bank's capital base. These are goodwill, to be deducted from tier 1 capital and investment in subsidiaries engaged in banking and financial activities which are not consolidated in national systems. Such deductions as expressed by the latter are essential to prevent the multiple use of the same capital resources in different parts of the group. The risk weighted approach to capital adequacy assessment is further expatiated and discussed in sub-

section 3.4.4.

3.4 The Measurement and Assessment of Capital Adequacy

Capital adequacy is generally assessed in terms of the ratio of capital and resources to total deposits. Some monetary authorities, like the Bank of England, at times prefer to employ a ratio of free resources to public liabilities whereby investments in fixed assets such as premises, in subsidiary and associated companies and in unquoted investments are deducted from capital and resources, and a residual figure is set against deposit liabilities and other liabilities (Bank of England, 1975).

The Bank agrees that although capital/deposit ratios do provide some measure of the overall capital adequacy of a bank, in present circumstances, it is thought that a more effective measure is capital resources in relation to the risks, if any, in different classes of assets. The assessment of capital adequacy on this basis may be derived from figures of total capital resources, but a bank's capacity to withstand risk is also to some extent dependent on the element of freely usable reserves within that total. The Bank suggested that the assessment of capital required for protection against risks should be made in relation to broad categories of assets instead of basing it on individual assets. For instance, as earlier mentioned, fixed assets must be covered on a one-to-one basis by capital resources. Assets such as cash and balances with the Bank of England etc are to be regarded as risk-free. Other assets such as loans and advances are also categorised according to their degree of risk, e.g. an unsecured loan will attract a higher rate of solvency requirement than a secured loan. Other assets that need to be covered by capital reserves will be noted in this review.

Our discussion of the subject of assessment of capital adequacy cannot be complete without recognising that almost every country in the world has got its own set of solvency ratios, ranging from simple net worth/deposits or net worth/total assets ratio through a net worth/risk assets ratio to the complicated ones like those of the Federal Reserve System in the U.S. and in Nigeria which are based on capital requirements appropriate to each of a long list of asset classes. While it is difficult to comment on such wide range systems, we have discovered that there are certain

features common to all systems of prescribed solvency ratios. The following common features have been listed by Revell (1975): first, a fixed minimum of capital required for licensing or recognition by the authorities; secondly, it is a normal expectation for any new company to incur losses during the early years of its life before profits can be made and reserves accumulated from earnings. Thirdly, the existence of risks entailing heavy losses; the probability that a particular institution will suffer large losses of this type is generally quite low, but if it does the greater part of a small net-worth could be wiped out in one stroke. A good example of this type of risk is the possibility of damages in a law suit.

In Nigeria as well as other parts of the world, the tendency over the past 5 years has been to raise minimum levels of capital required for licensing. In some countries, the minimum capital is put so high that it prevents new entry and encourages monopoly.

Most regulatory authorities in many countries relate bank capital to some items on its balance sheet like total liabilities, total deposits, other liabilities, total assets less liquid assets and other assets. By relating capital to liabilities, the regulators are seeking to sustain the confidence of depositors and creditors in the banking system. Another justification for relating a bank's capital to liabilities is that there is a relationship between the amount of liabilities and the risk of losses resulting from realising assets prematurely to meet deposit withdrawals. While it is agreeable that the ratios which measure a bank's capital in relation to its liabilities/deposits can be regarded as useful indicators of a bank's gearing, in the sense that they measure the extent to which the bank's assets are financed by depositors, the usefulness of such ratios as a measure of a bank's soundness remains questionable, as the capital/deposit ratio does not take into account the risk characteristics of the bank's assets themselves. It is widely acknowledged that the major sources of vulnerability in banking are the risk assets held by banks. The risk assets are of more importance in assessing the soundness of a bank than the relationship between capital and deposits. It seems meaningless therefore to impose the same capital-deposit ratio on two banks with the same deposit base but different

risk-asset portfolios. What really matters in solvency then is the *degree of risk selection by each bank, not the absolute size of its deposit base* (Oduyemi, 1981).

We agree entirely with this conclusion on the grounds that since capital/deposit ratio fails to take into account the risks attached to a bank's assets, it is possible to have a relatively high ratio of capital to deposits but a very low ratio of capital to risk assets. Having shown that losses mostly result from a bank's assets, we agree that there should be a shift from capital/deposit ratios to capital/assets ratios, as solvency ratios based on the latter are of more value in determining how vulnerable a bank is. Capital/asset ratios are generally designed to ensure that possible losses arising from a bank's assets are covered to a certain minimum extent by the bank's capital. Thus, it recognises the functional role of a bank's capital as the cushion to absorb losses which are inherent in risk assets. It also allows a bank's deposit/liabilities to expand without having to increase capital as long as the deposits are used to finance quality assets.

It must be noted, however, that it is not always easy to determine the degree of risk inherent in bank assets. And to determine capital requirements of each bank, it is essential to assess the degree of risk in each asset. Some monetary authorities have devised means of evaluation which have not been found so far to be accurate and scientific. In the U.S., bank examiners use the method of evaluating the loan-assets of banks by careful scrutiny and examination which may lead to loans being classified as good, substandard, doubtful and loss. Those categorised into substandard, doubtful and loss are totalled up and a percentage of the total of each category is expected to be covered by capital. For example, loans classified doubtful need capital requirement of 50% while those classified loss must be covered 100%. The U.S. system has been adopted by the Central Bank of Nigeria. In the U.K., the Bank of England ascribes weight to different categories of risk assets. For example, loans and advances are weighted unity, while bank premises are given a weight of two. The risk-asset ratio is then calculated by multiplying each balance sheet item by its weight to produce the adjusted total of risk assets, which total is then expressed in relation to the capital base of the bank. We criticise the rigid capital asset ratios

on the grounds that such ratios do not recognise that economies of scale\scope play a major role in influencing the loss profile of a bank. Large banks with well diversified spread of high quality loan-assets will be less exposed to losses and therefore require relatively less capital for credit risks. If there is a default on one of the loans this will be a small proportion of its total loan portfolio, unlike a small bank with a narrower customer base. Also, large banks are less exposed to liquidity risks than the smaller ones because for bigger banks, any withdrawals of deposit represent a small proportion of its total deposit base. Finally, bigger banks tend to have easier and cheaper access to capital and money market funds than the smaller banks.

Revell (1975) discusses the Bank of England approach of using the concept of *free resources* (net worth less fixed assets) in capital adequacy assessments. the same approach is implicit in Vojta's (1973) scheme. This approach is preferred for a number of reasons including the following:

- 1) It completely removes the possibility of artificially boosting capital ratios through frequent revaluations at times of rising prices. In fact, it dodges the valuation problem altogether, since equal amounts are deducted from both sides of the balance sheet whatever the valuation. Fixed assets may be carried at book value without distorting the balance sheet, and there is no artificial incentive to incur the considerable expense of frequent professional valuations.
- 2) It concentrates attention on the amount of net worth available to serve as a risk cushion.

3.4.1 Capital Ratios: Uses and Limitations

Capital ratios have been used as a means of determining solvency of banks since the time when it was generally believed to be the only sure test of soundness. We have seen how, over the years, bank capital ratios have steadily declined after it was proved conclusively that strong capital ratios do not insure solvency. The most popular capital ratios over the years have been those which relate a bank's capital to some items on the balance sheet, such as total liabilities, total deposits, total assets,

etc.

The question that has agitated the minds of banking experts, including regulators and practitioners, is the degree of reliability of capital ratios as a means of determining the soundness of banks. What evidence do we have to prove that bank failure is related to poor capital base?

In a study conducted by Orgler (1975) to analyse the predictive performance of capital adequacy measures in estimating recoveries from failed banks and to improve the prediction of recoveries by adding other variables to the capital measures within the context of a multivariate model, it was shown that simple capital ratios and other financial variables that are calculated from bank statements are of little use in predicting net recoveries from failed banks. While this result is not surprising, given the limitations of accounting information, it raises some doubts on the widespread use of simple capital ratios.

In a more recent study, Koehn and Santomero (1980) tried to examine explicitly the issue of portfolio reaction on the behaviour of commercial banks. It was found that regulating bank capital through ratio constraints appears to be an inadequate tool to control the riskiness of banks and the probability of failure. Also, Pringle (1974) concluded that the key determinants of optimal capital policies are future-oriented i.e. expectations regarding future loan demand, deposit levels and financing costs. Capital adequacy guidelines based on static balance sheet ratios (capital/deposits, capital/risk assets, etc), the usual regulatory approach, thus have little relevance to shareholder interests.

The trend of de-emphasizing capital ratios started long before academicians began their debate. For many years academicians seem to be moving towards the elimination of ratio analysis as an analytical technique in assessing the performance of a company. Attempts have been made to bridge the gap rather than sever the link between traditional ratio analysis and the more rigorous statistical techniques which have become popular among academicians in recent years (Altman, 1968).

In the U.S.A. the ratio of capital accounts to deposits of the average insured bank is shown by Apilado and Gies (1972) to have declined from 14.7% in 1935 to

8.7% in 1969. In the U.K. up to 1969, banks were not required to declare their true profits hence part of the capital and reserves appeared in the balance sheets under deposits. From 1969, however, Revell (1975) showed that the U.K. clearing and Scottish clearing banks began to declare true profits and the average ratio of capital to public liabilities declined from 3.8% in 1969 to 2.5% in 1974. The reason attributed to the decline is the fact that deposits and assets have grown faster than capital. Studies have also shown that the decline in capital ratios in the U.S. and U.K. has had a parallel in almost every European country. Banks in the Netherlands, West Germany, Switzerland, Belgium and the Scandinavian countries have been roughly comparable to equivalent U.S. banks in size of capital accounts and, in fact, banks in France and Italy tended to maintain much lower ratios similar to those of the U.K. banks. Major Japanese banks have also maintained lower levels of capital than do U.S. banks.

Vojta (1973) concluded, after a thorough review of a number of studies on the relevance of capital ratio in assessing the solvency of banks that:

"The weight of scholastic research is overwhelmingly to the effect that the level of bank capital has not been a material factor in preventing bank insolvency, and that ratio 'tests' for capital adequacy have not been useful in assessing or predicting the capability of a bank to remain solvent. Further, the documented insolvency experience of the banking system suggests that the most important causal factors relating to solvency are competence and integrity of management."

Thus, according to Vojta, in periods of stability bank failures are likely to be caused principally by inept or dishonest management practices.

Secrist (1938) studied 1,784 ratios of capital/deposits for national banks in the U.S. which covered from 1921 to the year of failure and 1,221 ratios from 1921-1931 for national banks which did not fail. Capital/deposit ratio to be maintained in accordance with the prevailing regulatory standard was 10%. Secrist found that the ratios were lower for non-failures than for failures, that the earlier the time of failure the higher the average and prevailing levels of capital. Thus, the assertion that banks in order to remain solvent must have ratio of at least 10% is illusory. According to

this standard the safer institutions are those first to fail. The same conclusion was reached in regard to the ratio of capital funds to total liabilities by Secrist (1938) and Cotter (1966).

Apilado and Gies (1972) tested statistically the applicability of Federal Reserve Board of New York's capital/adjusted risk asset tests for capital adequacy and an excess capital approach as defined by Cotter (1966) in a study covering the period of 1960-69. The overall results show that the Federal Reserve Board's formulation does not clearly show that banks which failed would likely be capital-deficient at the time of failure. They found an excess capital approach to be more promising. They agreed that it could not be unequivocally concluded from the study that ratio analysis is useful in measuring capital adequacy. Bank failures cannot be attributed to particular standards of capitalisation that have been maintained. In the depression, banks failed because they became illiquid as a consequence of the deterioration in asset portfolios. In more normal conditions, incompetent management practices were the primary cause of failure. The behaviour of regulators, particularly in the U.S. gave credence to these conclusions. In the 1950s Federal Reserve regulators moved to a **capital/adjusted risk asset** approach to capital adequacy which related capital funds to risk assets computed as total assets less a more broadly defined category of relatively riskless assets; the standard usually applied was \$1 of capital funds required for \$6 of risk assets in the balance sheet.

In 1952, the Federal Reserve Bank of New York began a new system of categorising all assets according to risk and assigned capital requirements to each. Minimum capital required was defined as equal to 100% of computed capital requirement; banks with capital funds of over 125% were rarely questioned. In 1956 adjusted risk asset approach which introduced a liquidity test, a new dimension to capital adequacy requirements, was tried. With this system, banks which experienced liquidity problems required more capital. In 1962 the Comptroller of the Currency departed from the prevailing regulatory standard by officially de-emphasising traditional ratio analysis as an approach to capital adequacy in favour of a focus on managerial performance articulated in general guidelines appropriate for banks

operating in normal conditions.

The new approach of the Comptroller of Currency may be summarised as follows: The standard capital to deposit ratios are no longer relied upon because such arbitrary formulas do not always take into account factors like:

- (a) Quality of management.
- (b) Liquidity of assets.
- (c) The history of earnings and of the retention thereof.
- (d) The quality and character of ownership.
- (e) The burden of meeting occupancy expenses.
- (f) Potential volatility of the banks deposit structure.
- (g) The quality of operating procedures.
- (h) The bank's capacity to meet present and future financial needs of its trade area considering the competition it faces.

The following formula which relates capital to the volume of loans and discounts was introduced:

$$\frac{\text{Gross Loans} + \text{Discounts}}{\text{Total Capital} + \text{Reserves}}$$

Where gross loans exceed 7 times the total capital accounts, that is an indication of problem. Loans are analysed for quality and liquidity. Earnings also are given due attention and weight.

It was realised that a bank with a good earnings record would enjoy the following advantages:

- (a) pay adequate salaries and thus attract and retain executive talent;
- (b) withstand a shrinkage in asset values;
- (c) raise new capital because of greater investor appeal;
- (d) permit the payment of competitive interest rates on deposits;
- (e) support investment in modern and efficient premises, fixtures and equipment.

A bank with good earnings record is therefore a more viable competitor.

Measurement of asset quality through credit examination and loan

classification was introduced. The volume of aggregate assets classified doubtful and loss are related to gross capital funds and reserves.

A very crucial aspect of bank performance is management. In judging the quality of management the overall condition of the bank was taken into consideration: for example,

- liquidity position;
- earnings compared with banks of similar size;
- the adequacy of its credit files;
- the effectiveness of collection efforts;
- the quality and distribution of the investment account;
- the adequacy of internal controls; and
- the efficiency of operations.

On the whole it can be seen that regulatory opinion in the U.S. is deeply divided on the issue of capital adequacy. The position is aptly described by Vojta as follows:

"In essence, the Federal Reserve Board's adjusted risk asset/liquidity approach quantifies capital required to protect a bank under abnormal conditions. Additionally, non balance sheet factors are weighed in judging the bank's capital position. The FDIC continues to rely on a ratio of capital funds, net of investments in fixed and sub-standard assets, to average total assets. The comptroller of the currency de-emphasizes static ratios, relying instead on guidelines for appraising management performance and viewing the bank as a going concern under normal conditions."

The conclusion that the capital ratio has not been a good guide in assessing solvency of banks was brought out more clearly in relation to the post-depression period in the study conducted by Vojta (1973) as follows:

"FDIC (Federal Deposit Insurance Corporation) experience is the best record on bank failures available. From 1934 through December 31, 1968, the FDIC made disbursement to protect depositors in 473 insured banks with 1.6 million depositors with total deposits amounting to \$838.7 million. 99.7% depositors were fully paid representing 97.1% of total deposit... There have been no banks in recent times that were closed principally because of economic factors."

FDIC also confirmed that the causes of bank failure have been wholly related to

incompetent or dishonest management.

The logical conclusion from this analysis is that quality of management is of paramount importance and remains the most effective safeguard against insolvency or bank failure. Therefore, while it is essential to consider capital in assessing a bank's ability to perform, it is perhaps more important to investigate the bank's managerial efficiency. Walter Bagehot had supported this in concluding that, *what is needed for a sound banking system is not good laws but good bankers*. Invariably, the quality of management determines the quality of its assets, and the degree of care exhibited in risk selection. The quality of management manifests itself in the soundness of internal control systems, prevention of fraud and ability to manage liquidity. The truth is that no amount of capital can save a bank that is grossly mismanaged. Gardener (1981) provided empirical evidence which suggests strongly that ratios and legalistic approaches to capital adequacy are both inaccurate and misleading tools when used alone. He suggested a complementary approach which utilises a computer simulation model to test a bank's prudential strength in a forward looking setting, which he described as contingency testing.

3.4.2 Liquidity and Solvency in Commercial Banking

Revell (1976) described liquidity as the ability to settle debts on the due date, and solvency as the ability to settle debts ultimately or at any date. In other words, liquidity is concerned with ensuring the availability of funds in the day-to-day business of a bank under normal conditions, whereas solvency is concerned with the availability of funds under crisis situation. In the long run, both solvency and liquidity are concerned with the same basic problem, which is the availability of funds in cash to meet the obligations of the company.

There are other reasons why a bank wants liquidity, apart from settlement of debts. Encompassed in the settlement of obligations is deposit withdrawals. A bank is legally required to pay its demand deposits whenever its customers want them, which alone is sufficient to dictate the bank's concern for liquidity. The other compelling reason why a bank needs liquidity is the need to be able to meet the

reasonable loan requests of its customers. Not only are bank loans profitable, but a bank that would not or cannot make loans to its depositors when they need funds is not likely to keep those depositors for very long.

Liquidity and capital adequacy are two performance measures required for the maintenance of a sound banking system. Section 6(2) of the Banks and Other Financial Institutions Decree (BOFID) of 1991 stipulates that the Central Bank of Nigeria may specify the minimum ratio which licensed banks shall maintain between their respective paid-up capital and all retained earnings, on the one hand, and their loans and advances, on the other. This ratio has varied between 1:12 and 1:10 in Nigeria in the last decade. Liquidity ratio is another regulatory instrument of the Central Bank, which is concerned with the amount of cash and short-term funds which banks must maintain for their day-to-day operations. This ratio has varied between 25% and 30% during the last 10 years.

(a) Cash Flow Analysis Approach

The various sources of liquidity would not be apparent in the conventional balance sheet as published annually if liquidity is related to the balance sheet structure alone. To be of use, such conventional balance sheet would need to have the maturities of deposits and loans specified in aggregate, but instead it is done by type of assets. Balance sheets would also have to list all lines of credit and other liquid resources already negotiated by banks. Even if the balance sheet presentation is modified in this way it would not enable one *"to determine how the financial institution proposed to use the resources of liquidity available; it would show merely what resources were available at some point in the past"* (Revell 1975). We now review another approach which will show the plans of a bank for ensuring the liquidity of its operations over the next one year or so through the use and application of the techniques of cash flow forecast, which will cover in detail all the different types of cash inflow and outflow.

The procedure is simple. It consists of projecting the inflows and outflows of cash expected over a future period as a result of the normal operations of the bank

and predicting the increase or decrease in cash requirements at the end of each interval of the period. The increases or decreases in cash requirements are then met by accommodating flows of various kinds. The accommodating flows could be in form of: (i) purchase or sale of liquid assets; (ii) use of borrowing; and (iii) changes in the timing of the operating flows by the use of trade credit.

Some advanced models of cash flow forecast attach probabilities to each of the inflows and outflows, and an optimum level of liquidity is often suggested by the use of computer simulation. This approach emphasizes the future implication of operation of the bank on its liquidity. Cash flow analysis has been recommended as a useful approach to liquidity adequacy because it shifts emphasis away from the historical data embodied in even the most recent balance sheet and focuses attention on immediate future plans of operation. And according to Revell (1975), Liquidity of the company is ensured by budgeting for sources of funds to cover any expected cash deficiency.

Revell concluded that *the cash flow forecast is potentially the most important accounting document for the use of supervisors. It gets away from the historical data embodied in even the most recent balance sheet, and it directs attention to the management plans for the institution for the immediate future.*

(b) Assessment of Liquidity and Capital Adequacy

Bank of England (1980) provided the basis for assessing the adequacy of liquidity of all deposit-taking companies, in order to determine their ability to meet their obligations when they fall due. Such obligations mainly comprise demand deposits, deposits at short notice, term deposits and commitments to lend, including unutilised overdraft facilities. Banks are expected to show ability and capacity to meet these primary obligations. The Bank listed three ways in which the capacity may be provided.

- i) by holding sufficient immediately available cash or liquefiable assets;
- ii) by securing an appropriately matching future profile of cash flows from maturing assets;

- iii) by maintaining an adequately diversified deposit base in terms both of maturities and range of counter parties (bank and non-bank) which, depending importantly on the individual bank's standing in the market and on the general liquidity situation in the system at the time, may provide the ability to raise fresh deposits without undue cost.

Banks are expected to maintain at all times a prudent mix of these three forms of liquidity in order to satisfy the Bank of England supervisory objective. The responsibility for ensuring liquidity was placed on the management of banks as no specific ratio was imposed on banks. The Bank continues with its normal surveillance over banks by monitoring their activities including liquidity management. The original method for measuring involved a comparison of deposit liabilities with specified liquid assets.

According to Bank of England, this approach has the virtue of simplicity but does not take account of the development of liability or asset management techniques for controlling liquidity through cash flows. This approach also involves an over-sharp distinction between liquid assets and other assets, many of which will be capable of generating cash in particular circumstances.

The new method recommended by the Bank in 1980 is based on cash flows approach in which liabilities and assets are inserted in a 'maturity ladder', with the net positions in each time period being accumulated. In the first maturity bands on the ladder this measure, by comparing sight and near sight liabilities with cash and assets capable of generating cash immediately, is similar to a customary liquid assets ratio. Marketable assets are placed at the start of the maturity ladder, rather than according to their maturity date, but account needs to be taken of limitations on their marketability and their susceptibility to price fluctuations. Commitments are recognised by being included in liabilities or as agreed in specific cases. The measure is thus a series of accumulating net mismatch positions in successive time bands (Bank of England, 1980).

Ultimately, a bank with a persistent liquidity problem must curtail its lending activities, as excessive lending is usually the major cause of a shortage of liquidity. If

a bank is unable to attract sufficient deposits, but continues to expand its lending activities, this will result in illiquidity.

3.4.3 On the Relationship Between Liquidity and Capital

Revell (1975) fully examined the ways in which liquidity and capital are related in modern banking. He identified four forms of liquidity for a bank:

- 1) the currency, demand deposits and other perfectly liquid assets held by it;
- 2) its assets that can be readily sold with little risk of loss;
- 3) its projected net cash inflows from on-going business; and
- 4) its ability to acquire additional cash by borrowing.

This item referred to as *liability management* is a relatively new concept. Items (1) and (2) are both connected to capital in the same two ways.

On the one hand, a bank reduces its revenues and its net income by remaining highly liquid, *ceteris paribus*. By increasing its liquidity, a bank reduces the capacity of its current earnings to absorb losses without diminishing its previously accumulated capital and also decreases the amount of net earnings from which it can increase its capital through retained earnings. On the other hand, by decreasing its liquidity held in forms of (1) and (2), a bank is increasing the chance that deposit withdrawals or the maturing of long-term liabilities will wipe out its liquidity and so force it to sell less liquid assets at a considerable loss. This loss will decrease its net income. from which new capital can be accumulated through retained earnings, and could even cause a net operating loss that would reduce the bank's capital. Thus, there is an optimum liquidity position for the bank that balances lower expected revenue against lower risk of running out of liquid assets to meet withdrawals.

Underlying this trade-off is the impact on the bank's capital position. Too much or too little liquidity held in forms (1) and (2) can adversely affect the bank's capital. According to Short (1978), a high rate of cash inflow suggests a high rate of net earnings and this implies that a bank can absorb unexpected losses and will be able to augment its capital through retained earnings. There is certainly the likelihood

that a bank with a net cash outflow will have to compensate by drawing down its liquid assets or by borrowing more. The negative cash flow itself suggests a very poor earning position and actions taken to compensate for reduced liquidity by running down liquid assets and resorting to liability management may lead to additional losses. Thus low cash inflow may be a symptom of poor net earnings and may aggravate this situation.

The fourth form of bank liquidity is a bank's ability to borrow additional funds to meet unexpected cash needs owing either to withdrawals of deposits and other short term liabilities or the identification of profitable new lending opportunities. Although the practice of borrowing to obtain additional funds is very old, the treatment of and reliance on the potential to borrow as a source of liquidity, which is referred to as *liability management* is relatively new to banking. Liability management is generally thought of as a bank's ability to borrow in a very short-term interbank market (such as call money or certificates of deposit), but also encompasses deposits as source of additional borrowing. The essence of liability management is that, when it is in a bank's interest to do so, it can borrow additional funds instead of running down its liquid assets or re-allocating its cash flow.

Liability management and capital adequacy are also related. First, a bank's capacity to borrow partly depends on lenders' assessments of its solvency. Of course a bank that is believed to be virtually insolvent will be unable to borrow at all. Second, illiquidity that obliges a bank to borrow to satisfy its cash requirements, instead of choosing to do so as the profit-maximizing alternative, will reduce the bank's net earnings and may even cause it to suffer a loss that will have to be charged to its capital. Moreover, if lenders know about the bank's predicament, they may require the bank to bear an onerous interest rate. Thus, borrowing that is forced upon a bank can be destructive, by eroding its net earnings and capital. Short (1978) aptly summarised this important discussion in the following words: *Liquidity can be viewed as the availability of funds that ensure that a bank can pay its current obligations (including deposit withdrawals and maturing long-term liabilities), while capital can be regarded as funds that ensure that all liabilities could be repaid if the bank were to be*

liquidated. Considered in this manner, the only difference between liquidity and capital is the time perspective - liquidity referring to the present and capital to some indefinite period in the future.

3.4.5 Convergence of Capital Measurements and Standards⁴

In 1974, in the wake of significant international banking disruptions, the governors of the Central banks of the member countries of the 'Group of Ten' plus the government of the Central Bank of Switzerland, established in Basle, Switzerland, the Committee on Banking Regulations and Supervisory Practices. This Committee was more recently renamed the Basle Committee on Banking Supervision. Since its inception, the Committee had cultivated the practice of meeting regularly three to four times a year. It serves as an informal forum for on-going co-operation on banking prudential supervision matters.

The Committee's primary aim is to encourage a gradual convergence of bank supervisory practices of the member regulatory institutions by enhancing the scope and effectiveness of supervisory techniques for international banking activities, by studying and making recommendations on specific areas of prudential concern in international banking, and by facilitating the exchange of information among bank supervisors so as to upgrade the quality of international bank supervision (Norton, 1992).

The Committee began making its impact with a paper (popularly called the Concordat) which it prepared in 1975, proposing guidelines for the respective responsibilities of different bank supervisory authorities regarding the supervision of banks where those entities were operating in more than one national jurisdiction (Norton, 1992). This was in response to the identified need to close existing supervisory gaps with regard to international banking operations. Among other areas

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This section benefitted a great deal from Norton, J. J. ed. (1992) **Bank Regulation and Supervision in the 1990s** (Lloyds of London Press Ltd) and Pecchioli R.M. (1987) **Prudential Supervision in Banking**, OECD.

of practical co-operation among supervisory authorities were, direct transfers of information, direct inspections by parent authorities on territory of host authority and indirect inspections by host authorities at the request of parent authorities. The 1975 Concordat was revised and expanded in 1983.

Another significant area in which the impact of the Committee's efforts has been felt is in the area of evolving capital measurements and capital standards for banks. The Committee published its report on the risk based capital adequacy ratio in July, 1988. This represents a modification of the 1987 proposal which it put forward. The 1987 proposals was similar to the contents of the US/UK accord which was being implemented from January 1987. The US Federal Banking Regulatory Authorities and the Bank of England agreed on a common capital adequacy system which was implemented along with each country's domestic regulatory process/system, with the hope that eventually, the common system would be installed.

Believing that *a weighted risk ratio in which capital is related to different categories of asset or off balance-sheet exposure, weighted according to broad categories of relative riskiness, is the preferred method for assessing the capital adequacy of banks*, the committee distinguished two tiers of capital and five risk weights corresponding to the perceived risk associated with five categories of risk assets. Tier one capital refers to core capital which comprises equity capital and published reserves. Tier two capital include perpetual preferred stocks (or preferred stock having an original maturing date of at least 5 years) and qualified subordinated debt adjustment to capital.

The 1988 agreement contained several modifications to the 1987 proposals. Non-cumulative preferred stock is now to be included in the definition of tier one core capital. The Report also indicated that term debt instruments must have a minimum original term of maturing of over five years to qualify for inclusion into tier two capital.

As for the risk weighting of assets, in differentiating between the categories of risk assets, higher weights are assigned to higher risk assets. The five categories of risk assets attract risk weights of 0%, 10%, 20%, 50% and 100% on perceived

credit risks in such categories. Government securities with remaining maturities of 91 days or less would be assigned a 0% risk weight while all other federal government and agency obligations would be assigned to the 10% risk category.

Assets in the 0% class, reflecting no significant risk, were to include vault cash and claims on the domestic central bank; the 10% class included short-term claims of international governments or government agencies; the 20% risk assets such as short-term claims on domestic or foreign banking institutions and government guaranteed loans, the 50% group included claims on domestic national government sponsored agencies and claims on multinational development institutions and all domestic and local government general obligation claims; and the 100% category involved the greatest degree of long-term risk, including long-term (over one year) claims on domestic depository institutions of foreign banks, most claims on foreign governments, and all other assets.

In Nigeria, short-term assets such as cash in hand, cash balances held with banks in Nigeria and federal government treasury certificates and treasury bills attract 0% weight. The famous liquidity mop-up instrument; that is, assets held in the form of stabilisation securities also attract 0% weight. Balances with banks outside Nigeria attract a risk weight of 20%. As for loans, facilities to government and its agencies attracts 0% risk weighting, residential mortgage loans attract 50% weight while private sector commercial loans attract 100% weight. The same applies to other types of loans as well as fixed and other assets.

The purpose of the capital agreement was to strengthen the capital base of the banking system. Banks have been observed to have made rapid progress toward attaining the prescribed standards. A relatively long transitional period of five years was felt necessary noting the varying degrees of adjustments that would need to be made by banks in different countries. To, however, aid the attainment of the minimum standard weighted risk asset ratio of 8% (of which at least 4 percentage points should be in the form of core capital), a target ratio of 7.25% was prescribed to be met by the end of 1990 (of which 3.25 percentage points must be in the form of core capital). These transitional targets were also adopted in Nigeria over the

same period.

To the extent that Banking hinges a lot on confidence, quite a number of banks have felt that their market position could be enhanced, by strengthening their capital position, especially in line with the Basle capital ratio. This has seen a number of them adhering to the set target even before the take-off date.

Bankers and other observers are known to have claimed as the major objective of the Basle agreement, the levelling of an uneven playing field among banks and their international counterparts. This was, however, not so. Principally, it was geared towards the strengthening of the capital position of the international banking system. As Hayward (1991) further noted, systems of bank supervision have hardly been created to ensure fair play, but rather to ensure the safety and soundness of national banking systems and protect interests of depositors.

3.5 Investigation of Bank Performance: A Review of Some Significant Approaches

Bank performance can be measured using different proxies. In some instances, we may restrict our attention to the net profit after tax as the measure of bank performance, in some profit before tax while yet in others, it may be based on the level of loans and advances, total assets or deposits. Many measures do exist and have been adopted and employed both in theory and practice to measure and rate performance of banks. The measures identified above, not being an exhaustive one in the least, are essentially magnitudes and the use of such factors has been generally criticized. They do not really allow for an interbank comparison of performance as they do not remove the scale effects. More appropriately, financial ratios have been adopted which, among other things, are capable of giving an indication of management efficiency, loan composition and risk, liquidity, profitability as well as capital adequacy. The use of financial ratios has a major advantage in that they do correct for size and scale and their use by firms in general and banks in particular dates back over 75 years.

Bank performance has attracted so much investigation due to the fact that banks occupy a special position in any economy, both developed and developing, and

play a significant role in the economy. They are, as it were, the bedrock of the economy. As such, in the history of banking and economies of many nations, banks have been perhaps the most widely regulated of all businesses (Adekanye, 1986; Oyejide and Soyibo, 1988). More specifically, the focus on bank performance has both been along pure and applied research. Efforts have been geared towards identifying the causes of bank failures, which at a time, was a fairly common occurrence particularly in the United States economy, and the development of signal systems for detecting impending failure some periods before it manifests itself. The latter is a preventive approach rather than a curative approach. In the 1940s and 1950s over 100 banks failed in the United States and more are still failing from time to time. In terms of magnitude this is a relative significant size being an economy that had over 15,000 banks at the time. However, the significance in terms of proportion still does not adequately reflect the dangers and problems to the economy, inherent in such failures.

Bank performance related research have been considerable in respect of both the determinants or factors that are highly associated with failure/success and the possibility of knowing before hand that in a short period, if no adequate measures are taken, the bank may go bankrupt. This latter aspect has attracted and sustained the attention of researchers, both academics and bankers, as well as the monetary authorities, for more than 30 years. The research efforts cover the characteristics of problem banks, predictors of bank failure, predictions of bank failures, analysis of bank performance, determinants of *de novo* bank performance, prediction of commercial bank failure in a deregulated era and identification of problem banks. Most of these research efforts have been centred upon commercial rather than merchant banks and, in very many of the cases, unit banks, which form the bulk of the banking sector of the United States. Also, perhaps over 75% of existing relevant literature has been based on United States' banks with little or no focus on banks in developing economies. Awareness, relative lack of experience of bank failure, relatively small number of banks, and the lack of adequate data are major reasons for this.

From the foregoing, we find it necessary to state, at this juncture, that, although, it would have been desired to review as much as possible the several facets of research on bank performance, due to space and time constraints, such a comprehensive survey cannot be embarked upon. Essentially, for the purpose of this study, we review as much as possible the major efforts and issues on the development of models which are capable of signalling impending trouble for banks. These models are more appropriately referred to as Early Warning Systems (EWS). In establishing an early warning system, the bank regulator's primary desire is to minimise the misclassification of problem banks as non-problem banks.

In each of the many instances in which such systems of models have been developed, it has tended to proceed along two main directions:

- (i) identification of the significant factors determining the *health status* of the banks, and
- (ii) based on the best set of factors, attempting a prediction or classification.

The latter part is usually an attempt to assess, with the view to improving upon, the predictive capability of the models. These models in many cases are being adopted by Bank Supervision Departments and the Federal Deposit Insurance Corporation (FDIC) for classifying banks into problem and non-problem banks in the United States.

The development of Early Warning Systems (EWS) has been variable with respect to:

- (a) the classification of banks/firms into groups;
- (b) the adopted factors of prediction or relative significance;
- (c) the adopted techniques of analysis;
- (d) the level of aggregation;
- (e) the classification of information adopted; and
- (f) the conclusion reached.

Classification of Banks

With respect to the classification of banks, while some have used the problem/non-problem classification (Sinkey, 1975), some adopt the failed/non-failed classification, while still some use bankrupt/non-bankrupt classification. Korobow and Stuhr (1975) used vulnerable/resistant classification while Hunter and Srinivasan (1990) and Arshadi and Lawrence (1987) adopt the financially successful/non-financially successful classification. The use of classifications though centres around bank performance essentially, also portrays that while banks which have failed completely have been compared with banks which survived during and after the same period as the latter (as in the case of failed/non-failed classification), in the other instances in which there have been no failure, measures had been taken prior to classifying banks into vulnerable and resistant classes with subsequent analysis having been based on this. Hunter and Srinivasan (1990) used vulnerable/resistant classification and defined as a financially resistant bank one whose return on assets (ROA) is at least 80% of the median ROA for established banks with less than \$100 million in assets in the same bank's state of charter. The problem/non-problem classification as adopted by Sinkey (1975) was based on the classification by the FDIC. A problem bank, going by this classification, is one that, in the eyes of the Federal Banking Agencies, has violated a law or regulation or engaged in an unsafe or unsound banking practice to such an extent that the present or future solvency of the bank is in question.

These problem banks are identified during bank examinations. The purposes of bank examination being (1) to determine the asset quality of the bank's portfolio, (2) to determine the nature of liabilities, (3) to ascertain compliance with laws and regulations, (4) to evaluate controls, procedures, accounting practice and insurance, (5) to evaluate management and its policies, and (6) to determine capital adequacy. To the FDIC a problem bank is of significant interest since it poses a greater risk to its insurance fund than a non-problem bank (Sinkey, 1975).

Adopted Predictive Factors

In the second instance, we mentioned the factors adopted for prediction. The majority of the studies have attempted to characterise or discriminate among the banks through the use of financial ratios, and other non-quantifiable factors. Economic conditions have also been reflected as well as demographic conditions. It has also been shown that the financial condition of a bank can be ascertained based on an examination of market information such as bond and stock prices (Pettway and Sinkey, 1980; Simons and Cross, 1991). Pettway and sinkey (1980) established this in their Early Warning System (EWS) which relied essentially on both accounting (financial ratio) and market information. Also, these factors can be classified as endogenous (internal) and exogenous (external) factors. This is based on the believe that the financial condition of banks is dependent on both factors under the control of the bank and factors outside its control. One of the high points of EWS research is to determine the relative importance of these factors. These have been attempted in Fraser, Phillips and Rose (1974). Arshadi and Lawrence (1987), Pantalone and Platt (1987) and Hunter and Srinivasan (1990).

It is impossible to compile a list of all financial ratios that have been used in EWS development research in particular and those used on daily basis over all financial organisations in general. In most of the studies, very many are tried, measuring different aspects of performance but are usually not stated in the article presented. Usually only those previously established to be significant are adopted or just a few are tried. For instance, in one of the pioneering attempts made by Altman (1964), twenty-two ratios were used and grouped into five major categories, viz liquidity, profitability, leverage (gearing), solvency and performance, five of which were selected and reported as providing the best combination of ratios for the prediction of bankruptcy. In Hunter and Srinivasan's (1990) model these ratios and variables were classified into eight areas: (1) bank operating cost structure, (2) leverage, (3) loan portfolio composition, (4) credit policy, (5) liquidity; being financial ratio-oriented factors, and (6) local market structure, (7) state branching law and (8) the economic climate of the local trade areas.

Korobow and Stuhr (1975) used the set of variables described below: (a) management quality (interest earned/interest paid), (b) management efficiency (operating expenses/operating revenue), (c) capital adequacy (gross capital/total assets and gross capital/total loans), (d) risk exposure (use of federal funds and other borrowing, average interest on time and savings deposits, total loans/total assets, rate of return on loans and the ratio of commercial and industrial loans to total loans), (e) liquidity as reflected by a bank's holding of Government securities; and (f) size, as measured by total deposits. It is important to mention, in support of our earlier assertion that Korobow and Stuhr also recognised the existence of other variables which could in fact be indicators of resistance to financial difficulty or vulnerability, as their list was not meant to be exhaustive.

Pantalone and Platt (1987) classified the factors used as follows: (i) profitability; (ii) management efficiency; (iii) leverage; (iv) risk/diversification; and (v) state economic variables. The state economic variables include the percentage change in (a) disposable personal income; (b) residential construction; (c) unemployment and (d) population. Of all these, in the final analysis, only the change in residential construction was found to be significant as an extraneous determinant of the local area banks' financial condition. Fraser, Phillips and Rose (1974) considered both demographic factors and economic factors and those employed included: (a) total population; (b) urban-rural mix of the population; and (c) population density. Economic factors included (a) growth of aggregate bank deposits; (b) taxable non-farm payrolls; (c) growth of urban population and (d) retail sales. None of the economic factors were found to be significant contrary to Pantalone and Platt's (1987) findings. However, the demographic factors were significant determinants of bank performance. Fraser, Phillips and Rose (1974) had considered six major groups of variables consisting of (a) bank costs, (b) composition of bank credit, (c) composition of deposits, (d) demographic factors, (e) market structure factors and (f) economic factors. Of these factors, only the set of economic factors were found to be insignificant in determining bank performance.

Predictive Ability of Bank Performance Models

The research on EWS also highlights the accuracy of these models in the prediction of bank success or failure, or better still, in the model's ability to predict *ex ante* the financial state of the banks upon which the model was developed and estimated. Many of the models after having been estimated are used to reclassify the sample banks. The predictive ability of the model is then obtained by examining the percentage of banks correctly classified and by implication the impressive predictive capabilities ranging from about 70% to 99% in many instances. The predictive ability as in the case of already established failed banks and thus in a failed/non-failed classification, has been shown to diminish the farther the period before failure. In most cases, the models are capable of signalling impending trouble over a maximum period of two years. Pantalone and Platt's logit model recorded correct classification ability of 83.1%, 82.4% and 73.5% for the period 12 months, 18 months and 24 months before failure respectively. The same trend is observed in Korobow and Stuhr (1975) and Sinkey (1975).

Techniques of Analysis

On the techniques of analysis employed, one can observe as the major techniques (a) the multiple regression analysis, (b) multiple discriminant analysis; (c) canonical correlation analysis; (d) probit and (e) logit analysis. Of these techniques, the Multiple Discriminant Analysis (MDA) was employed mainly between the early 1970s and early 1980s while in recent times the more suitable and similar techniques of probit and logit analysis have been employed. Notable among the studies which have employed multiple regression analysis are Meyer and Pifer (1970), Orgler (1970) and Parosh and Tamari (1978); those that have employed MDA include Sinkey (1975), Pettway and Sinkey (1980), Korobow and Stuhr (1975), Altman (1968), Altman et al (1977), Deakin (1972), Stuhr and Van Wicklen (1974). The canonical correlation approach was adopted by Fraser, Phillips and Rose (1974). Probit analysis was used by Hunter and Srinivasan (1990) and Arshadi and Lawrence (1989) and Korobow, Stuhr and Martin (1976) while logit and regression approach have been

used by Martin (1977) and Pantalone and Platt (1987).

Essentially, apart from the multiple regression analysis, all other techniques are designed for delineating, among many characteristics common to a host of subjects, which are the most significant for distinguishing the subjects into status groups. Canonical correlation analysis is different from the others to the extent that it allows for the inclusion of more than one dependent variable linearly related which can be explained by a linear combination of other independent variables. While the MDA is similar to both the logit and probit techniques, it differs in that it cannot generate probability contribution of each of the independent variables to the occurrence of the dependent variable and it is easier to test for the significance of each of the independent variables. The logit technique is a modification of the probit technique, both techniques being very similar. While the probit model is suitable for two group classifications (success/failure), the logit model is adequate for more than two groups classifications just as is the MDA. However, for the case of two groups classification, the logit model yields the same result as the probit models. Consequently, since only two group classifications have been adopted in EWS research, those studies which have applied the probit technique could also have applied the logit technique and vice versa, without any loss of generality. These two techniques compute the coefficients of the independent variables via an iterative likelihood estimation procedure.

Information Classification

In highlighting the high points in the development of EWS, we mentioned the adoption not only of varied group classifications but also of varied information classifications. We have mentioned applications which have reflected the adoption of demographic and economic factors. Market information has also been considered (Pettway and Sinkey, 1980; Simmons and Cross, 1991). In each of the applications, at least one out of considered factors has been found significant. The implication of this is that in all instances these various information classes should be considered though some may turn out to be insignificant. The peculiarities of each situation

determines the significance of the factors. This has been demonstrated by the order of importance of Altman's variables which were observed different in Abegunde's (1990) analysis. The disparities in this illustration are perhaps too significant. Examples can also be cited for United States bank applications as in Sinkey (1975) and Pantalone and Platt (1987). The above indication also suggests the variety of conclusions that have been reached in the various applications.

Other indirect use of MDA in the development of EWS include the application to the prediction of De Novo expansion in bank merger cases (Gilbert, 1970) and the establishment of On-Site Banking examination priorities by Pettway and Sinkey (1980). The major aim of this study was to help bank examiners develop an examination queue based on a dual-screening technique through the use of both accounting and market information.

Conclusions of Some Relevant Studies

In concluding our review of approaches to bank performance we review in fairly specific detail landmark applications and development of EWSs. The pioneering effort or development of Early Warning Systems in general can be traced to Beaver (1966) followed by Altman (1968) and Altman (1973). Altman also documented further applications in Altman and Loris (1976) and Altman et al (1977) where he developed an early warning system for over-the-counter broker dealers and the Zeta model respectively, the latter being a new model for identifying bankruptcy risk of corporations. Deakin (1972) also reports a discriminant analysis or predictors of business failure.

Briefly, Beaver showed that through the use of a dichotomous classification test, some financial ratios could predict failure. The test, however predicts the likelihood of bankruptcy through the use of a given financial ratio only. The test is criticized because it decides the 'optimal cut-off' point after looking at the actual status of the firms whereas in real situations, through the use of financial ratios one has to make his decisions without access to this information. He considered as the best predictor of failure the ratio with the smallest percentage of misclassification.

The cash-flow/total debt ratio was found to be the best predictor followed by the profitability and gearing ratios.

Altman (1968) provided a model which rather than consider one ratio, considers a number of ratios simultaneously in order to alleviate the problem of different ratios serving as conflicting indicators of the firm's health status. The model indicates which ratios are the most important indicators predicting failure and what weight are attached to them, using the MDA technique. Altman used a non-failed/failed classification. Of the twenty-two ratios tried, five were found to be significant. These include working capital/total assets; retained earnings/total assets; earnings before interest and taxes/total assets; market value equity/book value of total debt and sales/total assets. The last index was found to be the greatest contributor as it accounts for the greatest discrimination. Altman's model has a predictive capability of 95% a year prior to failure while it drops to 72% correct classifications two years before. In the 1973 study of Railroad bankruptcies, Altman used the same variables and got about the same results. In this later study he found other additional variables to be capable of discriminating between failed and non-failed firms.

Perhaps the pioneering attempt at investigating failure predictors for banking firms is the model of Meyer and Pifer (1970). Four reasons are identified and postulated for in this study as being the causes of bank failure. These include (a) local economic conditions; (b) general economic conditions; (c) quality of management and (d) integrity of employees. A sample of 60 United States banks were used, 30 each of which belonged to the failed and non-failed categories respectively. Indeed each sample of failed bank was matched with a non-failed bank of about the same characteristics to correct for sample bias. Using stepwise regression the following variables were found significant in the model which demonstrated an 80% correct classification ability one or two years prior to failure: (a) error in predicting ratio of cash and securities to total assets; (b) variation in the rate of interest on time deposits; (c) ratio of time to demand deposits; (d) operating revenue/operating cost; (e) operating income as a ratio of total assets; (f) growth of cash and securities relative to total assets; (g) variation in loans; (h) real estate loans

as a ratio of total assets; and (i) fixed assets to total assets ratio.

Sinkey (1975) reported a multivariate statistical analysis of the characteristics of problem banks by Sinkey and Walker (1974). In this application, newly identified problem banks are matched with non-problem banks and MDA is applied to test for group mean difference, to describe overlap between groups and to construct rules to classify observations. Data was collected on 110 banks while controlling for bias, over the period 1969-1972. The category of factors considered include liquidity, loan volume, loan quality, capital adequacy, efficiency and sources and uses of fund. The findings indicate that different ratios within these categories are significant discriminators between groups. The predictive ability or correct prediction increases from 61.8% in 1969 to 77.7% in 1972. Sinkey further stated potential advantages of an effective early warning system as being: (a) to enable the banks to more efficiently allocate their resources; (b) to make more efficient use of pre-examination data; (c) to incorporate some objective criteria; (d) to provide bank-regulatory agencies with an evaluation of their examination and supervisory performances and (e) to provide a basis for assessing deposit insurance premiums.

Fraser, Phillips and Rose (1974) report the results of the application of canonical correlation analysis to the relationship between performance of banks and the structure of banking markets, demand for bank services, costs and other factors. Some of the adopted measures/factors have been mentioned earlier. The performance indices used include (a) interest and fees on loans/total loans; (b) total bank loans/total assets; (c) income before taxes/total capital; (d) service charges on accounts/demand deposits; and (e) interest on time and savings deposits/total time and savings deposits. The internal factors such as bank costs, deposit composition, and the composition of loans were all found to be important determinants of bank performance. Of the exogenous factors, only the demographic variables proved to be consistently important at the 99% confidence level. The market structure variables, upon which so much interest has been centred at both the regulatory agencies and in courts, turned out to contribute little explanatory power in affecting the performance of the sample banks.

Korobow and Stuhr (1975) in their application used the vulnerability/resistant group classification. The paper aimed at providing an indication of a bank's ability to withstand adverse economic or financial developments from data that are regularly available without on-site examination. The study is essentially a fortification of results of an earlier analysis (Stuhr and Van Wicklen, 1974; Sinkey and Walker, 1974; Sinkey, 1975). The ratios employed resembled Sinkey's (1975) and the major categories have been mentioned earlier. The model reflected increasing predictive capability from 89.7% to 96.7% between 1969 to 1975, the same period.

Pantalone and Platt's (1987) article, which aimed at predicting commercial bank failure in an era of deregulation, demonstrates how specific bank failures can be predicted fairly accurately, well in advance of failure, even when the basis for these predictions is limited to publicly available information. A variety of ratios from balance sheet and income statement items were calculated for each six-month period up to 24 months prior to failure. The financial ratios considered for the analysis covered a wide range of management activities in an attempt to capture any possible area of mismanagement. The ratios as earlier mentioned were categorised as measuring profitability, management efficiency, leverage, risk diversification, and health of the state economy. The financial variables/ratios included in the final model are traditional measures of bank performance and risk-taking and they are similar to measures which have been found to be most successful in predicting bank failure, by earlier researchers. A major finding of the article which adopted the logit technique of analysis is that the principal cause of bank failure remains the same as in earlier decades, namely poor bank management, resulting in excessive risk-taking or a lack of controls that permits fraud and embezzlement. Deregulation and other factors that have led to a more competitive environment appear to have affected the overall rate of bank failure rather than the pattern among banks, and local economic conditions have had only a peripheral effect on either the overall rate or pattern of bank failure.

Probably the most recent effort at determining bank performance is that of Hunter and Srinivasan (1990). Two things make this application essentially different from earlier attempts. These include (i) the use of financially successful/non-

financially successful classification; and (ii) the use of probit technique of analysis. The explicit goals of their analysis were to characterize the marginal impact of bank specific attributes on the probability that a *de novo* bank will be financially successful and to determine whether exogenous market and regulatory factors play a significant role in determining financial success. Using a sample of 169 independent banks chartered in 1980 from 32 states, one of the findings of their analysis is that being chartered in a state that allows statewide branching increases new bank's probability of success. They conclude also that, contrary to Arshadi and Lawrence's (1987) canonical correlation based results, that market structure variables had no significant impact on new banks' probability of success. Bank survival is again shown to depend largely on factors directly under the management's control. This agrees largely with findings of other researchers.

The above has been an attempt at reviewing determinants of bank performance with special attention being paid to development of early warning systems for predicting impending bank failure. Our models and techniques of analysis will borrow from these experiences comprehensively. The questionnaire which is part of the sources of information of this study reflects the various factors which will come into the models.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

In the earlier chapters we examined both theoretical and practical issues relating to bank performance. The role of, and the inter-dependence between, capital, liquidity and risk, among others, were discussed for their observed and expected significance in determining the performance and thus the financial condition, or better still, chances of survival of commercial banks. In particular, section 3.5 espouses in a fairly detailed manner the various issues of interest in the research into determinants of bank performance as well as the development of early warning systems (EWS), in general. One peculiar aspect of the research effort concerns the choice of technique of analysis adopted. The analytical techniques as were mentioned are varied. However, it seems fairly easy to isolate the most popular techniques adopted including the more recent attempts. Multiple Regression analysis, Canonical Correlation analysis, Multiple Discriminant analysis as well as the Probit and Logit techniques of analysis are perhaps the most significant of the techniques adopted.

What we attempt in this chapter is a somewhat watered down description of each of these techniques of analysis, emphasising their essence, capabilities and shortcomings. Such a description is deemed necessary as these techniques form the basis of our empirical analysis in the next four chapters. The questionnaire and survey design is discussed in the next chapter where it is more appropriate though it forms an integral part of the research methodology adopted for the study.

4.2 Exploratory and Multivariate Analysis¹

Multivariate regression analysis includes a variety of analytical techniques which are available for explaining the variation in one variate or characteristic by two

¹ This section relied considerably on Tatsuoka (1974) and Pyndick and Rubinfeld (1981).

or more other characteristics. In some cases this relationship when mathematically expressed can be used to predict the value of the variable being explained, once the value of other variates are given and known. In simple regression analysis, one seeks to explain a particular variable by expressing it as a function of some other variable. Multiple regression, which is simply an extension of simple regression, explains just one dependent variable by more than just one explanatory variable. Other multivariate techniques, in particular the ones discussed here can be classified ordinarily as multiple and suited to cases in which all variables are continuous. In such cases the least squares estimation procedure is used to obtain unbiased and consistent and efficient parameter estimates.

Just as in simple regression equation, the significance of the explanatory variables can be investigated based on the standard error tests, the t- and F-tests respectively. The t-test is applied to the significance of individual explanatory variables while the F-test determines the significance of the entire model specification. Some other tests do exist for establishing certain characteristics of the estimated equation. See Pyndick and Rubinfeld (1982). Additionally, the direction of relationship between the dependent variable and each independent variable is indicated by the sign of each estimated coefficient while the magnitude indicates the marginal contribution of each dependent variable.

In some other instances however, the independent and dependent variables may not be continuous variables. There are cases in which the dependent variable is simply a classification variable reflecting, say value 1 when sex of a person is male and 0 when female. The performance of the ordinary least squares regression estimation procedure is defective in these situations, yielding inefficient parameter estimates. While it is possible for the independent variable to have only two possible values, cases exist in which the possible values might be 4, 6, or 8 as in questionnaire responses. Such cases require more attention. In these instances we do not really seek to predict the value of the dependent variable but more importantly to identify which characteristics or variables are significant in explaining the variation in the dependent variable. The Multivariate Discriminant, Probit and Logit techniques are suitable for

such analysis as described above.

In another instance, rather than seek to explain or determine characteristics explaining one dependent or response variable, we may desire to identify the best combination of independent variables, for characteristics which explain the variation in a combination of independent variables. While the MDA, Probit and Logit analysis are suited to the case of one dependent variable, the canonical correlation analysis is developed for the analysis of the type described above. We now take a look at each of these models. The simple and multiple regression analyses are not included here for their established popularity and familiarity.

4.2.1 Canonical Correlation Analysis

Canonical correlation analysis is a natural extension of multiple regression analysis. The variable to be predicted in the latter consist of a single variable Y which is the dependent or response variable. However, in some situations the dependent variable may be composite, consisting of several variables. The method seeks to determine, therefore, the relationship between two sets of variables. Canonical correlation analysis identifies linear combinations of independent variables that are most highly correlated with linear combinations of the dependent variables. It defines the components of one set of variables that are most highly linearly related to the 'components' of the other set of variables. The highest correlation between the linear combinations of both dependent and independent variables is called the *canonical correlation*.²

Also, the overall correlation between the entire set of dependent variables and the entire set of independent variables, called the *canonical correlation index* is defined as

$$r_{\text{can}} = \sqrt{k_s} \quad (4.1)$$

where k_s represent the roots of the equations which express the maximum correlation

² See Fraser, Phillips and Rose (1974) for technical details of the Canonical correlation technique.

between the dependent and independent variables. The significance of the canonical correlation index may be tested by Wilk's criterion which is a chi-square test of the form³

$$\Lambda = \prod_{s=1}^m (1 - k_s) \quad (4.2)$$

where m is the number of independent variables which must be less than n , the number of dependent variables. The statistic Λ is distributed approximately as a chi-square with $m.n$ degrees of freedom.

The canonical correlation analysis was employed for analysis of predictors of bank performance by Fraser, Phillips and Rose (1974) and Arshadi and Lawrence (1987). A limitation of this method of analysis as was pointed out by Hunter and Srinivasan (1990), is that it precludes explicit calculation of marginal value or impact of independent variables on the dependent variable. The best linear combination of independent variables identified by the technique does not afford the ranking of these variables by relative importance. The associated tests do not tell whether the individual market structure variables are significant. This is a serious limitation which makes this technique quite unsuitable and inappropriate for the attainment of the objectives of this study in addition to the fact that there are multiple dependent variables which may be binary or multiple choice and/or continuous in nature. The study seeks among its major objectives to distinguish between resistant and vulnerable banks, thus making the dependent variable a single binary choice variable. Additionally, as a result of the technique's inability to calculate the marginal impact and direction of relationship of independent variables, the technique cannot be relied upon for classifying hold-out or out-of-sample banks by performance. This is very essential for bank supervisors and accounts in the main for why the technique has not

³ This test is suggested by M.S. Bartlett (1947) "The Statistical Significance of Canonical Correlation", Biometrika, vol.32, pp. 29-38.

been widely adopted unlike logit and multivariate discriminant analysis techniques.

4.2.2 Multivariate Discriminant Analysis

The Multivariate Discriminant Analysis (MDA) technique is used to classify an observation into several *a priori* groupings dependent upon the observation's individual characteristics. It is used primarily to classify and/or make predictions in problems where the dependent variable appears in qualitative form e.g. success or failure, bankrupt or non-bankrupt, resistant or vulnerable . A necessary initial step in this technique is the establishment of group classifications.

MDA attempts to identify the linear combination of independent variables which best discriminates/distinguishes between the established groups defined by the qualitative dependent variable. Alternatively stated, the mathematical objective of the MDA is to weight and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct as possible (Klecka, mimeo). The key equation in MDA is called the **Discriminant Function** and is similar to a simple regression equation with a dependent variable that represents group membership. Actually, the groups can be two or more. The coefficients of the function are not interpreted as in the multiple regression equations. However, they represent weights which signify the relative importance of the associated explanatory factors. The larger the weights the greater the associated explanatory variables contribution to the discrimination of the independent groups. These weights are therefore similar in essence to the t-tests conducted for individual explanatory variables in ordinary multiple regression analyses. With only two groups, some contributors have remarked that discriminant analysis in general is nothing more than a special case of multiple regression analysis. The reduction, however, holds just for the two-group case. Also the discriminant function, which are formed in such a way as to maximize the separation of the groups, once obtained can be used for the prediction of which group cases with certain characteristics belong. This enables us to check the predictive ability of the discriminant models. Discriminant analysis is a problem of finding a linear combination of the original predictor variables that shows

large differences in group means.

The significance of the discriminant functions may be tested by Wilk's lamda (or criterion) and their associated chi-square tests of significance. The Wilk's lamda is distributed approximately as a chi-square with $k-1$ degrees of freedom where k represents the number of groups. The larger the lamda, the less the discriminating power present. Eigen values and the associated canonical correlations are also used which denote the relative ability of each function to distinguish the groups. The higher the eigen value and canonical correlation the better.

The MDA is also used for classification after the initial analysis. Once a set of variables is formed which provides satisfactory discrimination for cases with known group membership, a set of classification functions can be derived which will enable the classification of new cases with unknown membership. Often times the classification functions are also used to classify the same sample cases from which it was derived. To aid the classification, a classification function is derived for each of the groups. Each function yields a probability of group membership for each case. A case is then classified into a group for which it has the highest probability of being a member. Usually, however, the problem with such procedures is that the rule of highest probability defines a very strict dividing line. For example, a .51 probability of being a resistant bank may not be significantly different from a .49 probability of being a vulnerable bank. We can assess the implications of an erroneous adverse classification for a typical case bank. To avoid such potential misclassifications, in practice, a *marginal* range of probability is defined.

4.2.3 The Probit Model

The Probit model was developed in an attempt to improve upon the linear probability model (Pyndick and Rubinfeld, 1981). This model belongs to the class of binary-choice models. Binary-choice models are suitable for those situations in which the cases considered are faced with a choice between two alternatives and the choice they make depends on the characteristics of each of the cases. The essence of the

Probit model is to estimate the choice that a non-sample member will make between two choices given that we know the characteristics of any choices made by the sample members. These models are developed to help predict the likelihood that a non-sample member with given characteristics will make any of the choices. The most basic of binary choice models assume that the probability of an individual making a given choice is a linear function of the individual attributes.

The Probit model is associated with the cumulative normal probability function. Suppose that Z_i is a theoretic (that is, not actually measured) index which is determined by an explanatory variable X_i , the index Z_i being a continuous variable which is random and normally distributed. We can then write:

$$Z_i = \alpha + \beta X_i \quad (4.3)$$

The problem solved by probit analysis is how to obtain estimates for the parameters α and β while simultaneously obtaining information about the underlying unmeasured scale index Z which is such that

$$Y = \begin{cases} 1 & \text{when first choice is selected; and} \\ 0 & \text{when first choice is not selected.} \end{cases}$$

Assume then that the choice of each individual is such that he chooses

$$\begin{aligned} & 1 \text{ when } Z_i \geq Z_i^* \\ \text{and} & \\ & 0 \text{ when } Z_i < Z_i^* . \end{aligned}$$

Since Z_i^* is assumed to represent the artificial cut-off values which translates the index into a choice decision and Z_i follows the normal distribution, the probability that Z_i^* is less than or equal to Z_i can be computed from the cumulative normal probability function. That is,

$$P_i = F(Z_i) = F(\alpha + \beta X_i) \quad (4.4)$$

where $F(\cdot)$ follows the cumulative normal distribution. The probability P_i resulting from the probit model can be interpreted as an estimate of the conditional probability that an individual will choose an alternative, given the individual characteristic X_i . By the above construction, it is observed that P will lie as is desired

and expected in the (0, 1) interval. The probit model generally involves non-linear estimation. The estimation technique is that of maximum likelihood. The Maximum Likelihood Estimation (MLE) procedure has a number of desirable statistical properties. All parameter estimators are consistent and also efficient and normal. A detailed estimation of the parameters of the probit model is contained in Pyndick and Rubinfeld (1981, p. 311).

To test the significance of all or a subset of the co-efficients in the probit or logit model when the maximum likelihood is used, a test using the chi-square distribution replaces the usual F-test. The probit model has been applied to the determination of factors significantly affecting *de novo* bank performance by Hunter and Srinivasan (1990).

4.2.3 The Logit Model

The Logit model which is often used as a substitute for the probit model is based on the cumulative logistic probability function and is specified as:

$$P_i = F(Z_i) = F(\alpha + \beta X_i) = \frac{1}{1 + e^{-Z_i}} \quad (4.5)$$

The logit (also called logistic) and probit formulations are similar; the only difference being that the logistic model has slightly fatter tails and is, therefore, more robust.

From the equation (4.5) we obtain

$$\text{Log} \{P_i / (1-P_i)\} = Z_i = \alpha + \beta X_i \quad (4.6)$$

The independent variable is the characteristic X_i while the dependent variable is the logarithm of the odds that a particular choice will be made. This equation cannot be estimated using ordinary least squares since if P happens to equal 0 or 1, the ratio $P_i / (1-P_i)$ will equal 1 or ∞ (infinity) respectively and the logarithm will be undefined. Again the maximum likelihood estimation procedure which applies to probit model is applied in estimating the parameters of the logit model. The logit technique has been applied by Pantalone and Platt (1987) for predicting bank failure during deregulation and Martin (1977).

4.3 Statistical Hypothesis Testing

Statistical hypothesis testing is a rather wide aspect of statistics. Generally, hypothesis testing involves a comparison between a null and an alternate hypothesis. The null hypothesis could be a basic claim or statement made about a population while the alternative or composite hypothesis, in most cases is ordinarily the opposite of the statement. For example, one could say that *there is no difference between the return on asset (ROA) of small banks and big banks in Nigeria*. This statement would represent the null hypothesis while the alternate hypothesis would read *there is a significant difference in return on asset (ROA) between small banks and big banks in Nigeria*.

The testing of this hypothesis requires obtaining information about ROA from small and big banks in Nigeria and doing a comparison based on statistical techniques. Usually, a statement is made about a population and the verification of this statement requires a representative sample to be obtained from the relevant population from which the truth about the statement can be verified.

Though many different tests of hypotheses do exist, we limit our exposition here to the test of differences in means between two populations. Suppose there are two populations 1 (small) and 2 (big) with population sizes N_1 and N_2 respectively. Assume that from each population a small sample of size n_1 and n_2 is drawn and let, for a measurable characteristic X (say, return on asset), the sample means for each population be \bar{X}_1 and \bar{X}_2 with standard deviation s_1 and s_2 . To test the hypothesis

H_0 : population means are equal ($\mu_1 = \mu_2$)

vs.

H_1 : population means are not equal ($\mu_1 \neq \mu_2$)

we use the Z - statistic (for the normal distribution) defined as

$$Z = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{\{s_1^2/n_1 + s_2^2/n_2\}}} \quad (4.7)$$

The decision to be made is based on the following decision rule:

- i) accept the null hypothesis H_0 if $|Z| \leq Z_\alpha$;
- ii) reject the null hypothesis H_0 if $|Z| > Z_\alpha$

where α is the level of significance and Z_α is the Z value at α . The decision rules (i) and (ii) define the familiar acceptance and rejection zones in hypothesis testing. The Z -statistic applies when the sample size from the population is large (i.e. $n_1, n_2 > 30$). However, for the small samples (i.e. $n_1, n_2 \leq 30$) the t -test is applied.

The above univariate tests as they are fondly called, can be employed to test for differences in certain characteristics observed between vulnerable and resistant banks for example, as would be done in the latter parts of this study. These tests were employed in the work of Sinkey and Walker (1977) and Sinkey (1975).

4.4 Comparative Advantages and Limitation of Techniques of Analysis

The various methods of analysis that have been discussed in the earlier parts of this chapter are to a large extent those observed to have been employed in analysis of predictors of bank performance and consequently in the development of early warning systems for commercial banks. These include the multiple regression analysis, canonical correlation analysis, multivariate discriminant analysis, probit and logit analysis and simple hypothesis tests of differences in sample means. While the other techniques are very similar, the univariate (hypothesis) tests differ significantly.

A number of differences exist between these techniques as can be delineated from our previous discussions. There are also advantages and limitations associated with the techniques. In application, the canonical correlation analysis differs significantly from the multiple regression, multivariate discriminant, probit and logit analyses. It determines the combination of independent variables that best capture the characteristics of a combination of variables which best explain the variation in one single variable. Further to this, although the canonical correlation analysis seeks to explain the variation in a linear function of dependent variables by a linear function of independent variables, it precludes the explicit calculation of the coefficients (or marginal impact) of the independent variables. Such calculation is

possible in the other techniques.

Compared with the other techniques (multiple regression, probit and logit), the coefficients of the discriminant function cannot be interpreted as marginal impact of independent variables on the dependent variable. They, however, serve as weights whose magnitude only signify the relative importance of the associated variables to the discrimination of the groups defined by the dependent variable. Furthermore, the estimates of parameters in the probit and logit techniques have additional properties of being unbiased, consistent and efficient. However, where the dependent variable is not a binary/multiple choice variable, while they are unbiased, they are not consistent and inefficient.

The special characteristics of the probit and logit techniques make them more attractive to researchers in situations in which a binary/multiple choice variable is to be explained (or distinguished) by one or a combination of explanatory variables. For our study, we desire to identify the combination of variables, discrete and/or continuous, which best distinguish resistant from vulnerable Nigerian commercial banks.

Also, in related bank performance research, the identified models are used for reclassifying the original sample or a hold-out sample with a view to assessing the predictive ability of the models. The MDA as well as the probit and logit techniques provide for this analysis while the ordinary multiple regression model performs inadequately. In this regard, the logit and probit models have not really been shown to be better than MDA-based models. They are, however, of greater appeal by virtue of the fact that they are more robust than the MDA models while their estimates of parameters can be interpreted just as in simple regression models.

The above discussion reveals that when the dependent variable is categorical or multiple choice in nature (for example, divided into two groups), the appropriate statistical techniques, include MDA, logit analysis and probit analysis. Logit and probit analyses are typically preferred to MDA because the results are more robust, and the co-efficients can be interpreted as regression coefficients calculated for new observations as the probability of classification in one of the two groups which is

arbitrarily chosen (Pantalone and Platt, 1987). However, the use of Logit versus Probit analysis has no practical consequence with respect to the analysis of the results (Amemiya, 1981; Pyndick and Rubinfeld, 1981). They differ essentially to the extent of being based on different cumulative probability distributions, the logit probability distribution having fatter tails compared with the cumulative normal probability distribution.

4.5 Conclusion

For the purpose of this study, we adopt the univariate t-test (or hypothesis tests), the MDA and Logit analysis respectively. The univariate tests are employed to compare the sample averages of particular financial ratios between resistant and vulnerable banks. Where the sample averages are established as being significantly different, the ratio or factor serves as a distinguishing factor between the categories. The collection of distinguishing factors would intuitively form a combination which distinguish between the classes of banks. A limitation of these tests is that they only assess individual significance of the factors/variables. However, there are reasons to believe that situations may exist where a combination of factors best distinguish between the groups of banks.

Both the MDA and Logit analysis are individually employed to correct for this limitation. The use of both the MDA and Logit techniques is premised on the need to conduct an assessment and comparison between the identified models. The objective in this regard was to assess the ability of identified logit models based on discriminant reclassification and vice-versa. Finally, perhaps a major limitation of the MDA and Logit analysis in this study is the fact that the results would be sensitive to the criteria defining vulnerable from resistant banks.

The conclusion with respect to the choice of techniques can be appreciated from the discussions of the various techniques of analysis, bearing in mind the comparative advantages and limitations in the light of the objectives of our study.

CHAPTER FIVE

A DESCRIPTIVE ANALYSIS OF SURVEY RESULTS

5.1 Introduction

In this chapter, we dwell essentially on the conduct of the survey, the structure of the survey instrument and discuss the results of the frequency analysis conducted on survey results. The next section discusses the state of data on bank performance in Nigeria. The structure, focus and content of the questionnaire as well as the process of data collection are discussed in section 5.3 while in section 5.4 we discuss the qualitative characteristics of sample banks, especially those which can be expected to affect their performance. This includes their distribution by head office location, involvement of technical partners, type of management, branch network and structure as well as ownership. An analysis of the perceived determinants of bank performance is then discussed bearing in mind the qualitative characteristics to observe any visible trend. The remaining sections concentrate on the effect of the role of regulatory authorities and prescribed policy guidelines on bank performance and the views of bank management as to the effect of the recent influx of banks with the attendant increased competition also on bank performance.

5.2 The State of Bank Performance Data in Nigeria

Prior to 1989 when the Nigeria Deposit Insurance Corporation (NDIC) was established to function in a fashion similar to the U.S. model of the Federal Deposit Insurance Corporation (FDIC), data on the operating characteristics and performance of the banking system could be obtained from the reports of the apex regulatory authority, the Central Bank of Nigeria (CBN). Specific data relating to individual banks could be obtained only from the Annual Reports and Statement of Accounts of each bank.

The Central Bank publishes its Annual Report and Statement of Accounts in addition to monthly economic reports, a half-year report (which started about 2-3 years ago) and economic & financial review published on quarterly basis. The portion of the annual report which focuses on the banking system contains details of the year's monetary policy as expressed in its monetary policy circular which spells out broad operating guidelines, restrictions and aspirations which are expected to affect the operations of banks in the current year. The report also incorporates the trend in monthly deposit, lending and minimum rediscounting rates which prevailed during the year. We have had, apart from the conventional commercial and merchant banks, other specialised banks such as the Federal Mortgage Bank of Nigeria (FMBN), Nigeria Industrial Development Bank (NIDB), Nigeria Agricultural Cooperative Bank (NACB) and the Nigerian Bank for Commerce and Industry (NBCI). Since 1986, we have also witnessed the establishment of community banks, private mortgage institutions and the Peoples' Bank.

Also contained in the CBN annual report is the trend in monthly credit from the banking system to the private and government sectors respectively. The report also indicates the changes in these indices. The holding of government securities by the banking system and other institutions and individuals are also indicated just as the changes in rates on securities.

The quarterly economic & financial review published by the Bank contains the consolidated balance sheet (asset and liabilities) of the Banking System. The balance sheets for commercial and merchant banks are separated. From these, the structure & growth of the assets and liabilities of the categories of banks can be evaluated. The profitability of the banking system is usually not included. Beyond the statement of assets and liabilities, the report also contains information on the average deposit, and lending rates of different financial institutions as well as the minimum rediscount rates of the Central Bank.

None of the Bank's publications contains details on the profitability of banks. Also, the performance of each individual bank can not be assessed. Financial information on each bank can be obtained only from the bank's annual report and

statement of accounts. The published statement of accounts essentially contain the bank's balance sheet and the income statement, which are useful for the assessment of bank performance. These financial statements are usually approved by the Central Bank before they are published. Copies are sent to the Central Bank and it is not uncommon to find banks exchanging their annual reports out of courtesy and in some cases with a view to promoting greater business cooperation between them. The structure and content of banks' annual reports have changed from time to time. The banking reforms which have culminated in the revision of the Banking Act of 1969 and the promulgation of Decrees 24 & 25, that is, the Central Bank Decree and the Banks and other Financial Institutions Decree (BOFID), have brought about changes in the contents of the financial statements of banks. Much more information is now revealed by banks than was hitherto the case. The reports are now more disaggregated than before. The prudential guidelines put in place in 1990 made it compulsory for banks to reveal the quality of their loan assets and equally make general provisions for other assets. Non-performing loans are now stated, and broken into substandard, doubtful and lost components. As a result, loan loss provisions as well as bank profits are now more realistic.

Banks are now mandated to reveal the structure of their loans by degree of security and the structure of their deposits by type and maturity. Prior to this time, some banks had only stated total deposits and liabilities as one figure without an explicit indication of the composition. Now that the deposit maturity structure is revealed, it is possible to examine the extent of reliance of the Bank on each type of deposit. Such is an important information but was seldom revealed until it was made mandatory. The structure and composition of the operating income and operating expenses of banks are now expressly revealed in their annual reports. Again, before the reforms, banks revealed the disaggregation only at will. The notes to the accounts of both merchant and commercial banks are now more explicit with every attempt made to examine the major components of the different financial aggregates. Despite these new demands, it is interesting to note that banks are not yet mandated to disaggregate their loan portfolio by sector. We can therefore hardly determine

from a bank's annual report, what proportion of its loan portfolio is accounted for by the agricultural sector or by manufacturing enterprises. This is quite surprising given that the sectoral credit allocation policy mandating banks to devote certain minimum proportions of their total loans to different sectors, has been a major component of monetary policy and banks' operating guidelines for more than two decades. Also, non-adherence to policy guidelines has attracted penalties while from September 1992, any bank violating the policy stood the risk of being classified a distressed bank. We, however, observed that in banks' monthly and quarterly returns to CBN they are required to disaggregate their loan portfolio by sector. These returns, which form the basis of CBN'S aggregate assessment of the banking system's adherence to policy, are not available to the public. When required they can only be obtained directly from the banks themselves. This we have attempted to do and it explains why a questionnaire approach was adopted. Since, it has been the practice by banks, especially prior to deregulation, to only disaggregate financial information at will from year to year, the need to have consistent and disaggregated information over our study period explains why a questionnaire approach was required. The questionnaire demands were based on the presumption that if banks had included aggregates in their annual accounts, it should be possible to obtain a disaggregation over quite familiar and uniform lines. The responses revealed that even this was not totally correct as a number of banks found it difficult to provide disaggregated information consistently for the study horizon.

Since its inception, the NDIC has also published annual reports which provide some information on specific banks. It is mandatory for all banks to insure their deposits with the NDIC. Such information as the number of branches per bank, the composition of each bank's board, the addresses of each bank's head-office are provided in the report. Statistics on bank frauds and the number of distressed banks (under its supervision) are also indicated in the report. Little that could be useful for assessing the performance of banks is indicated in the report. It is expected that sometime in the future the NDIC will publish detailed financial information or operating statistics about banks which will be useful for assessing their individual

absolute and relative performance.

From the above review of major data sources, the CBN, NDIC and banks' annual accounts, it can be appreciated that an additional effort is required to obtain the type of data required for our study. We considered the questionnaire approach as perhaps the best option. A questionnaire is drawn up and circulated to the Chief Executive Officers (CEOs) of all commercial banks which form the target population of the study. Faith in the efficacy of the questionnaire derived from the relationship of each of the CEOs with the author who was a personal friend to many and equally held the position of the President & Chairman of Council of the nation's foremost professional banking institute, the Chartered Institute of Bankers of Nigeria (CIBN). In the absence of such relationship, it is doubtful whether the response rate would have been as impressive. In spite of these positive factors, the returns from a couple of banks were incomplete and extremely poor.

5.3 The Construct and Administration of the Questionnaire

As was mentioned earlier, due to the largely unavailable data and other information as well as the highly restricted access to that which is available, the questionnaire approach had to be adopted here to gather relevant information through a survey of selected Nigerian banks. Additionally, some required information are not usually included in the Annual Reports and Statement of Accounts of Nigerian commercial banks. Though guidelines exist which indicate the minimum information requirements which banks must meet in rendering their accounts, the information content is far from being uniform from our examination of a sample of annual reports of Nigerian banks. In particular, this is observed to be true for some of the Banks which form the sample for this study.

For example, Statement of Accounting Standards and the BOFID of 1991, do not require that banks report the loan portfolio by sector. Hence, in the annual report of a typical Nigerian bank, it would be difficult to know the volume of loans to agriculture, manufacturing enterprises or even to the export sector. They are,

however, mandated to report such loans by degree of security and also by maturity. Essentially, there would be those loans secured against real estate, those otherwise secured and those unsecured. As for maturity there is little flexibility allowed in the determination of time intervals. As such the classifications may differ among banks. The Prudential Guidelines released in November, 1990, was issued in an attempt to further ensure that banks made adequate provisions against loan losses. Banks were also required to classify their loans as performing and non-performing.

Also, it can be difficult ascertaining what proportion of a bank's interest income is from loans. They are classified by bank and non-bank sources. Classification of other income faces a similar problem. Some of the key sources here are foreign exchange, fees, commissions, lease finance and others. While the other operating income of Commerce Bank Plc essentially followed the above classification in its 1991 annual report that of FSB International Bank Plc, a government owned bank privatised in 1991, classified the income under foreign exchange business, profit from trading activities and other fees and commissions. We observe in this case that fees and commissions were lumped together. Such classification problems are also associated with interest expense, total deposits and even total assets.

Apart from the classification problems, we have the problem of lack of consistency in reported figures. The practice in annual reports in general is to report along with the current year figures, those of the previous year to aid intertemporal performance comparison. The inconsistency we refer to comes in when, say the loans and advances figure reported for 1990 in the 1991 financial year does not tally with that reported in the 1990 published report itself. In some cases, this may be due to changes necessitated by regulatory and/or other government authorities. If for example the Inland revenue department prescribed a profit tax different from the estimate made by the bank itself, the after tax profit would change and the total reserves would also change. In these instances, the bank would only have the opportunity to reflect such changes in the next annual report. In Nigeria, banks are allowed to publish their annual reports after they have been duly audited and Central Bank of Nigeria's approval of the audited accounts obtained.

Apart from quantitative information which is a major requirement for the hypotheses in this study to be examined using the multivariate statistical techniques earlier discussed, we find the questionnaire a very useful tool for seeking the opinion of management of Nigerian banks on various aspects of bank performance in Nigeria, their perceived role and importance of such factors as liquidity, capital adequacy and bank cost structure; the monetary authorities, their various policy guidelines and the adherence to or compliance with them; and also the effect of the recent influx of new entrants into the banking industry. Knowing the prevalent attitude of majority of Nigerian firms toward requests made for the completion of questionnaires and provision of information, even when not elaborate, the questions were framed in very simple language and were made very short and concise.

The questionnaire provided tables for the quantitative information. In terms of structure and content, the questionnaire had aspects which sought information on the corporate background of the bank, branch network and performance indicators, and also on the management views concerning significant variables which were believed to be determinants of bank performance. Corporate background information includes among others, year of incorporation of business, year licence was applied for, year licence was granted, the existence or non-existence of foreign technical partnership agreements and the ownership composition of the bank which is particularly sought over a ten year period, 1980 to 1989. In Nigeria, three possible groups of people could own part or the whole of a bank. These include government (state or federal), private individuals and foreign investors. We covered these in the classification of ownership. It is postulated that ownership may result as being a significant determinant of bank performance. This is particularly plausible in the case of a developing economy. The view is widely held in Nigeria that the majority of state-owned banks have exhibited generally dismal performance over the years compared with predominantly private banks. The control of management, whether predominantly domestic or predominantly foreign, was also requested.

On branch network and employment, we sought information on the number of branches opened by each bank, their classification by major geographical area

location and rural/urban composition. In the recent past, Nigerian banks were mandated to open branches in rural areas which have become substantial loss avenues for the majority. It is felt that the proportion of rural to urban branches may affect the performance of a branch. Perhaps a more appealing variable would have been the ratio of the assets accounted for by this two categories of branches. This was however thought to be quite a difficult statistic to obtain from Nigerian banks. The questionnaire responses could be said to have justified this initial thought. The staff strength and its composition was also required.

The section which followed dwelt on vital statistics. A table is given which requires information on certain established, important and frequently used performance measures and other relevant information over the period 1980 - 1989. Some of the financial information include, aggregate bank loans (divided according to CBN's sectoral classification - agriculture, manufacturing and other sectors), total operating expenses, total assets (divided into risk assets and current assets), total deposit (also sub-divided into time, saving, current and other deposits), operating income and other measures. The compilation of the list of important variables has been informed by the requirements for computing the relevant financial ratios as have been adopted in previous studies.

The identification and selection of the quantitative information requested from banks in the questionnaire was based on a fairly comprehensive review of relevant studies in the literature. The financial ratios which have been used to measure different aspects of a bank's performance were reviewed and compiled for the purpose of our study. The components of these ratios informed the quantitative information required in the questionnaire. Beyond the need to know each bank's total loans, we requested a breakdown to examine the composition of the loan portfolio. Pantallone & Platt for example observed the ratio of commercial and industrial loans/total loans to be a significant determinant of commercial bank performance in the U.S. In Nigeria, the components of total loans are agricultural loans, manufacturing loans and other loans. This is explained by the sectoral credit allocation policy which places emphasis on sectoral breakdown of banks' loan

portfolio. It was expected that the loan concentration along these lines could also distinguish the performance of Nigerian banks. The general view among professional bankers is that agricultural loans are more risky and for long have attracted a relatively lower interest rate. Not until recently have banks begun to adhere to this policy stipulation. Before now, they had preferred to pay the penalties. Furthermore, such other schemes aimed at encouraging their response and adherence to the policy have failed. The Agricultural Credit Guarantee Scheme (ACGS) is one of such programmes. The U.S. banking system - based literature have emphasised in addition to commercial and industrial loans, consumer loans, real estate loans and other loans.

Ratios based on total assets also have variants which tend to be more specific relating to risk assets and current assets being the two major categories. Our definition of risk assets as the difference between total assets and the sum of cash and short term securities is in line with Sinkey (1975). The composition of total deposits is able to reveal the degree of dependence of a bank on different sources of generating funds. The components of deposits - time, current, savings and others, reflect differences in pricing, maturity and stability. The categorisation employed reflects the terminology and regulatory requirement as can be found in Nigeria. Specifically, time (term) deposits are more stable, have longer maturity and are more expensive. Current (or free) deposits are very cheap. Savings deposits represent the midway.

Total capital, shareholders funds, bad debt (loan loss) provision, total reserves are all requirements for calculating important financial ratios reflecting aspects of a bank's characteristics and performance. We also required total operating income and its breakdown into major contributing components. The aggregate figure is important to obtain the managerial efficiency ratio (operating expenses to operating income) among others. It is also important for the calculation of net income and by implication the profitability/earnings ratio (net income to total assets) as used by Pantallone & Platt. In Nigeria also loan income represents a major source of income. Income from securities is a prominent component only with respect to the

banks participation in the holding of government treasury assets and not really in income from the source. The treasury securities are considerably underpriced.

Government securities holdings which are the addition of a bank's holding of treasury bills and treasury certificates are required to compute liquidity ratios. One of such important ratios is the ratio of government securities holding to total assets. Sinkey (1975) used as a measure of a bank's liquidity, the ratio of its cash plus government securities holdings to its total assets. This accounts for why cash holding was requested in the questionnaire.

It is important to emphasise that due to the absence of regulations requiring such articulate and elaborate categorisation in banks' annual reports, it would have been difficult relying on the annual reports as our only source of information. This difficulty with data can be appreciated from a close examination of the table of financial information included in the Appendix. We observe many missing values where disaggregation of financial information is required. This accounts for why we were unable to assess the effect or significance of loan composition, revenue composition and composition of operating expenses on bank performance. If in spite of the opportunity provided by the questionnaire, these information could still not be obtained, what would have been possible if our reliance had been only on the annual reports and accounts of the banks.

The list of financial information required perhaps also indicates minimum information that should be published in banks' annual reports. Financial ratios are not directly required from the banking institutions. Rather we obtain the magnitudes with the aim of computing the financial ratios subsequently ourselves.

The final section in the questionnaire dwelt on the identification of the views of bank management as to the absolute and relative importance of a number of critical factors highlighted in the questionnaire. These factors include, capital adequacy; asset quality; managerial efficiency; loan portfolio; liquidity; revenue sources and application; ownership; regulatory guidelines and national economic variables. These factors are also expected to be ranked in order of importance as well as indicating the perceived direction of relationship. The Nigerian banking industry

has been under heavy regulation. A number of stipulations exist on the allocation of credit, cash reserve, liquidity and capital adequacy ratios. We desired to know from the respondent banks which regulations have been violated and which have been adhered to over the years. The essence of this for the study, in particular, is to check the effect of regulations on bank performance. Better still, to check the relationship between the extent of adherence to regulatory controls and the performance of Nigerian banks. Other information required included explanation on the expected role of the monetary authorities in the prevention of bank failure; the factors adjudged the most important determinants in signalling bank failure, methods of guiding against bank failure, relationship between regulatory controls and bank performance as well as the influx of new banks and possibility of failure.

In all, each respondent bank was required to provide answers to 31 questions. The questionnaire was made fairly close-ended to ensure unambiguous answers and consistency in responses.

A sample of twenty-four banks was selected for this study. The list of sample banks is given in Table 5.1 with the year in which they commenced banking business in Nigeria. Given the state of development of the banking industry in Nigeria, such elegant, theoretical and widely accepted sampling techniques such as simple random sampling, stratified sampling or even systematic sampling could not be adopted. Given the scope and intended coverage as well as the objectives of the study, our intention was, infact, to cover all banks operating within the industry as at 1985, just before the implementation of the Structural Adjustment Programme (SAP).

As of this time only thirty three (33) banks were operating in Nigeria. This list has however been greatly expanded with the financial liberalisation policy, as a component of the SAP. As of July 1991, 125 banks were known to be operating within the industry. The reason for concentrating on 1985 in the determination of our sample size stems from the fact that the study aims at identifying factors that were significant in determining bank performance prior to the adoption of SAP. Furthermore, by considering this category of banks one can have access to information that dates back a longer period. Also many of the new entrants would

Table 5.1: List of Respondent Banks

S. No.	Name of Bank	Abbreviation	Year
1	Habib Nigeria Bank	HNB	1983
2	Wema Bank	WBN	1945
3	Societe Generale Bank	SGB	1977
4	Pan African Bank	PAB	1971
5	New Nigeria Bank	NNB	1971
6	National Bank of Nigeria	NBN	1933
7	Gamji Bank	GBN	1984
8	Owena Bank	OBN	1982
9	African Continental bank	ACB	1947
10	Union Bank	UBN	1917
11	Nigeria Arab Bank	NAB	1962
12	United Bank for Africa	UBA	1961
13	Afribank	AFB	1960
14	Progress Bank	PBN	1982
15	Universal Trust Bank	UTB	1985
16	Co-operative Bank	COB	1954
17	Bank of Credit and Commerce	BCI	1979
18	First Bank	FBN	1894
19	Savannah Bank	SBN	1960
20	Nigeria International Bank	NIB	1984
21	Allied Bank	ABN	1962

just be publishing their second annual reports. The availability of information particularly on 'new' banks and for just two or three years seems largely inadequate for the attainment of the objectives of our study, if any meaningful results are to be obtained and useful recommendations made.

Additionally, there have been so many changes within the industry in the years since SAP and moreso in recent years that have tended to affect the banks that operated prior to 1985 much more than those just springing up. One major development in this regard, which although is very welcome by the majority of these banks, is the policy on prudential guidelines. As we mentioned above, the guidelines were put in place to ensure that the method of providing for non-performing assets was uniform among all the banks as well as to ensure that the true nature of the quality of banks' assets were adequately revealed. Perhaps, this was also put in place to portray the profits henceforth declared by Banks as true *cash profits* rather than *paper profits* which many had believed the banks declared hitherto.

By ending up with a sample of twenty-four (24) out of the thirty-three (33) existing banks, one can be said to have covered almost seventy-three (73) percent of the population of Nigerian commercial banks that were in operation in 1985. The reasons for the non-inclusion of the majority of these banks include their unimpressive record in information presentation, both in scope and content, in their annual reports. The little information that could be gathered were highly disjointed, largely incomprehensive and inconsistent. Evidently, this is a situation which could not be helped. It turned out also that the affected banks had insignificant market shares with their actions having little multiplier effect on the industry as a whole. The key group of banks were, however, included in the final sample.

To some extent our sample can be said to be a highly representative one in that it comprises banks with a wide range of characteristics which have the potential of enriching the analysis and our findings. Among these banks are those having their head offices located in Lagos, an area with the highest commercial activity level in Nigeria, and quite a number having head offices located in other capital cities outside Lagos. There are also those that are predominantly publicly-owned, with a high

degree of government intervention, and those that are predominantly private in ownership. Some have technical partners (and have had them for some time) while others have none (and have never had). We also include the three largest Nigerian banks, First Bank PLC, United Bank for Africa PLC and Union Bank PLC. Additionally, the structure of the branch network of these banks differ from bank to bank as well as from region to region.

Based on the significance of accurate and consistent information from banks for the successful completion and conclusion of this study, a high degree of personal touch was attached to the administration of the questionnaires. By this we mean that the questionnaires were forwarded directly to the Managing Director/CEO of each of the sample banks with an introductory letter on the personal letter headed paper of the author. The author enjoyed the full cooperation of his colleagues who held him in high esteem being, at the time, the President and Chairman of Council of the Chartered Institute of Bankers of Nigeria (CIBN), the only recognised professional body for practising bankers in Nigeria, and the MD/CEO of a young, dynamic and a highly reputable commercial bank. After the questionnaires had been despatched, several telephone calls were made to the Managing Directors by the author on a cordial note indicating the purpose of the questionnaire and calling for their cooperation by providing very comprehensive and consistent information. This was, however, not without a promise that all information would be handled in confidence. One would have thought that this approach would ensure a prompt completion of the questionnaires. This was not so in all cases. After about four months, reminders were sent and followed up with phone calls. This process lasted from July 1989 to October, 1990, and continued until 21 responses were collected. During the course of data collection, many banks complained that it was difficult to retrieve information which they had rendered 8 to 10 years ago since they were not computerised then (and were still at various degrees of partial computerisation). Additionally, certain grey areas which arose were explained on phone.

The response rate of the survey was very high. Out of the twenty-four (24)

questionnaires sent out, twenty-one (21) were duly returned, making a response rate of 87.5 percent (Table 5.1). Of course, the extent to which the required information was provided varied from bank to bank. Some were hundred percent completed and this was very impressive. Of note in this regard are United Bank for Africa, AfriBank, Co-operative Bank and National Bank. Table 5.2 presents our comments on the quality of responses obtained from each of the sampled banks. The questionnaire completed by one of the three big banks was very poor and consequently had to be dropped, at least as far as quantitative information is concerned.

The data questionnaires were also examined for consistency. We confirmed the correctness of the different sub-totals and also examined the trend of the various financial variables for possible outliers, the result of which may have been due to data entry errors or in some cases entry into the wrong columns or rows. Also, it was necessary to ensure uniformity in the information rendered. For instance, while some figures were in millions others were stated in thousands or hundreds of thousands for the different variables.

The following sections discuss in detail the responses of the sample banks to the qualitative aspects of the information provided, and in addition to the characteristics of these banks. The quantitative aspect is deferred to the next chapter where the information is employed for a more comprehensive inferential analyses.

5.4 Survey Results: Some Characteristics of Sample Banks

In the first part of the survey questionnaire, we requested for some background information on each bank. These included the name of the establishment (bank), the location of its head office, year of incorporation, year applied for banking licence and year of commencement of banking business in Nigeria. In the same section we sought information relating to whether or not the bank has engaged technical partners since it commenced operation as well as the ownership structure and the type of management.

In many cases the ownership differs from the bank's management, though the

Table 5.2: Quality of Questionnaires of Respondent Banks

S. No.	Name of Bank	Quality
1	Habib Nigeria Bank	Good
2	Wema Bank	Fair
3	Societe Generale Bank	Good
4	Pan African Bank	Good
5	New Nigeria Bank	Good
6	National Bank of Nigeria	Excellent
7	Gamji Bank	Fair
8	Owena Bank	Fair
9	African Continental bank	Good
10	Union Bank	Good
11	Nigeria Arab Bank	Good
12	United Bank for Africa	Excellent
13	Afribank	Excellent
14	Progress Bank	Good
15	Universal Trust Bank	Good
16	Co-operative Bank	Excellent
17	Bank of Credit and Commerce	Good
18	First Bank	Very Poor
19	Savannah Bank	Good
20	Nigeria International Bank	Fair
21	Allied Bank	Good

activities of the management may be a reflection (or an embodiment) of the implicit dictates of the ownership. This is characteristic of most publicly-owned Nigerian banks as well as in a number of the newly licensed banks. In this regard, it is not uncommon to find severe contention between the management and ownership of banks for control.

Table 5.3 displays a summary of the banks' characteristics in respect of technical partnership agreement, structure of ownership, and type of management. In addition, a summary of information provided in the second part of the questionnaire relate to bank branch network and employment.

We find that 60 percent of the sample banks have (at least until recently), had technical partnership agreement. In all cases the technical partners are from outside the African continent. In most cases the technical partners hail from Europe or America while the others have technical partners from the Far East. 40 per cent or 8 out of 20 banks have never had technical partners. Indeed on close examination virtually all the state-owned commercial banks in our sample have never had technical partnership agreement. An exception here is one state bank with technical partners from Dubai, in the United Arab Emirates.

Table 5.4 shows that the ownership structure of the sample banks has remained the same over the period 1985 to 1989. Of the twenty (20) banks comprising the ultimate sample, thirteen (13) are predominantly publicly owned. We maintain that a bank is predominantly public in ownership if the Federal or State governments or their agencies own more than 45 per cent of the shares. Also, where the board of directors of the banks are appointed by the federal or state government, we categorize the bank as being predominantly public in ownership. The remaining thirty-five per cent are predominantly private in ownership. Seven (7) of the 13 predominantly public-owned banks are wholly-owned by the government while only five (5) of the seven predominantly privately owned banks are actually wholly private in ownership. Hence wholly publicly-owned banks represent 35 percent of the sample banks. Predominantly publicly-owned banks represent 30 per cent, predominantly private owned banks 10 per cent and wholly private owned banks represent 25

Table 5.3: Ownership, Management, Branch Network and Staff Size of Respondent Banks

Year	Banks =>	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1989	Tech. Partnership	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Ownership	WPUB	WPRI	WPUB	WPRI	WPRI	WPUB	PPUB	PPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	FOR	DOM	DOM	DOM	DOM	DOM	DOM
	No. of Branches	35	13	55	46	10	117	63	239	41	97
	Rural Branches	6	5	25	22	3	49	30	55	22	27
	Staff Size	1211	413	1790	1215	204	4118	2360	11623	1105	3028
1988	Tech. Partnership	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Ownership	WPUB	WPRI	WPUB	WPRI	WPRI	WPUB	PPUB	PPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	FOR	DOM	DOM	DOM	DOM	DOM	DOM
	No. of Branches	35	6	49	35	7	104	55	225	31	91
	Rural Branches	6	2	20	14	2	40	26	52	13	21
	Staff Size	1127	172	1758	1105	190	4339	2097	11337	1002	3018
1987	Tech. Partnership	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Ownership	WPUB	WPRI	WPUB	WPRI	WPRI	WPUB	PPUB	PPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	FOR	DOM	DOM	DOM	DOM	DOM	DOM
	No. of Branches	28	3	47	32	4	102	44	212	28	85
	Rural Branches	1	0	20	12	0	39	18	48	12	20
	Staff Size	931	127	1723	1005	141	4491	1817	11226	908	3100
1986	Tech. Partnership	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Ownership	WPUB	WPRI	WPUB	WPRI	WPRI	WPUB	PPUB	PPUB	PPUB	PPUB
	Management	DOM	FOR	DOM	FOR	FOR	DOM	DOM	DOM	DOM	DOM
	No. of Branches	22	3	39	28	2	101	34	201	25	69
	Rural Branches	0	0	16	10	0	39	16	36	12	20
	Staff Size	925	113	1641	965	101	4551	1645	10735	810	2589
1985	Tech. Partnership	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Ownership	WPUB	WPRI	WPUB	WPRI	WPRI	WPUB	PPUB	PPUB	PPUB	PPUB
	Management	DOM	FOR	DOM	FOR	FOR	DOM	DOM	DOM	DOM	DOM
	No. of Branches	16	3	37	26	1	96	34	195	23	61
	Rural Branches	0	0	14	8	0	38	16	28	12	20
	Staff Size	540	84	1626	920	71	4425	1472	10078	725	2546
	Head-office location										
		Other	Lagos	Other	Other	Lagos	Lagos	Lagos	Lagos	Lagos	Lagos

Notes: For Technical Partnership, YES represents existence of such arrangement while NO represents the opposite; For Management we have Foreign (FOR) or Domestic (DOM). We have for Ownership, WPUB as wholly publicly-owned; PPUB, predominantly publicly-owned; PPRI, predominantly privately-owned; and WPRI, wholly privately-owned.

Table 5.3 Continued: Ownership, Management, Branch Network and Staff Size of Respondent Banks

Year	Banks =>	NBN	PAB	MNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1989	Tech. Partnership	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
	Ownership	WPUB	WPUB	WPUB	WPRI	WPRI	PPRI	PPUB	WPUB	PPRI	PPUB
	Management	DOM	DOM	DOM	DOM	DOM	DOM	DOM	DOM	DOM	DOM
	No. of Branches	112	28	57	20	33	180	64	10	23	50
	Rural Branches	50	18	26	6	23	87	30	5	11	26
	Staff Size	3483	912	1812	486	878	8033	1787	147	758	1236
1988	Tech. Partnership	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
	Ownership	WPUB	WPUB	WPUB	WPRI	WPRI	PPRI	PPUB	WPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	DOM	FOR	DOM	DOM	DOM	DOM	DOM
	No. of Branches	104	21	53	17	17	164	59	4	20	42
	Rural Branches	43	11	24	3	8	74	26	0	8	22
	Staff Size	3399	885	1774	385	841	7655	1517	117	588	1188
1987	Tech. Partnership	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
	Ownership	WPUB	WPUB	WPUB	WPRI	WPRI	PPRI	PPUB	WPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	DOM	FOR	DOM	DOM	FOR	DOM	DOM
	No. of Branches	101	21	50	13	16	148	48	3	17	41
	Rural Branches	41	11	22	0	8	69	16	0	8	21
	Staff Size	3430	896	1440	330	810	7644	1304	86	538	1089
1986	Tech. Partnership	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
	Ownership	WPUB	WPUB	WPUB	WPRI	WPRI	PPRI	PPUB	WPUB	PPUB	WPUB
	Management	DOM	DOM	DOM	FOR	FOR	DOM	DOM	DOM	FOR	DOM
	No. of Branches	101	21	41	11	16	136	40	1	14	39
	Rural Branches	41	11	20	0	7	60	15	0	5	21
	Staff Size	3804	956	1357	250	784	7194	1121	28	513	1000
1985	Tech. Partnership	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
	Ownership	WPUB	WPUB	WPUB	WPRI	WPRI	PPRI	PPUB	WPUB	PPUB	PPUB
	Management	DOM	DOM	DOM	FOR	FOR	DOM	DOM	DOM	FOR	DOM
	No. of Branches	88	21	37	7	14	129	33	1	13	34
	Rural Branches	28	11	16	0	6	60	14	0	4	18
	Staff Size	3938	1022	1329	180	780	6620	881	22	484	945
	Head-office location										
		Lagos	Other	Other	Other	Lagos	Lagos	Lagos	Other	Other	Lagos

Notes: For Technical Partnership, YES represents existence of such arrangement while NO represents the opposite; for Management we have Foreign (FOR) or Domestic (DOM). We have for Ownership, WPUB as wholly publicly-owned; PPUB, predominantly publicly-owned; PPRI, predominantly privately-owned; and WPRI, wholly private in ownership.

Table 5.4: Distribution of Respondent Banks By Bank Ownership, Management and Head-Office Location

Year	Technical Partnership		Ownership		Management		Head-Office Location	
	Yes	No	Public	Private	Foreign	Domestic	Lagos	Other
1985	12(60)	8(40)	13(65)	7(35)	6(30)	14(70)	12(60)	8(40)
1986	12(60)	8(40)	13(65)	7(35)	6(30)	14(70)	12(60)	8(40)
1987	12(60)	8(40)	13(65)	7(35)	6(30)	14(70)	12(60)	8(40)
1988	12(60)	8(40)	13(65)	7(35)	2(10)	18(90)	12(60)	8(40)
1989	12(60)	8(40)	13(65)	7(35)	1(5)	19(95)	12(60)	8(40)

Note: Figures in brackets represent percentages.

percent of the sample banks.

Changes in bank management have been recorded in the sample banks (and perhaps in the entire Nigerian banking industry). We see from table 5.4 that the management of the sample banks which are predominantly foreign which was 6 out of the 20 banks in 1985 has been significantly reduced to only 1 out of 20 by 1989. Thirty (30) percent of the banks were under a predominantly foreign management in 1985 to 1987. The proportion reduced to 10 per cent in 1988 and further to 5 percent in 1989. Hence by 1989 virtually all the sample banks were under domestic management. It should be noted here that a distinction exist between a technical partnership agreement existing between a Nigerian bank and some other overseas bank and the type of management existing in the bank. While it is clear from the table that 12 of the banks have technical partners, fourteen (14) on the average between 1985 and 1989 were under domestic management. A popular misconception has often been held in this regard where industry watchers associate the existence of a technical partnership agreement in a bank with foreign control over bank management.

Also, the banks are varied in the date of commencement of banking business. Going by the classification given in table 5.3, eleven (11) banks commenced business between 1894 and 1970, four (4) commenced business between 1971 and 1980 while six (6) commenced business between 1981 and 1985. This represents 52.4 percent that started in 1894 - 1970, 19 percent that started in 1971 - 1980 and 28.6 per cent between 1981 and 1985. All the banks that operated prior to 1971 were predominantly public in ownership. Of the four (4) which commenced business between this time and 1980 one (1) was wholly privately owned while (1) one was predominantly public in ownership. Three (3) of those that commenced business between 1981 and 1985 were privately owned while the others were wholly state government owned.

It is common for Nigerian commercial banks to locate their head-office in Lagos even if and when some other performing branches are located in some other places outside Lagos. Our sample shows 60 percent of the operating banks to have

head-offices in Lagos with the remaining 40 percent locating their head offices elsewhere. One notable feature in the responses in this regard is that a higher proportion of the state government owned banks have their head offices in their state capitals which are outside Lagos. All wholly privately owned banks have their head offices in Lagos.

With respect to the second part of the questionnaire which dwells on information on branch network and employment, a summary of relevant information is contained in Table 5.3. In this table we observe that the older banks have a higher number of bank branches, rural branches and staff employed. This was, however, not unexpected. Indeed, one cannot say much about the characteristics of the banks in this regard. Rather than look at the absolute values it will be more useful to consider the information relative to other financial variables such as profit, total deposit or total assets. The details in this respect are provided in the chapter that follows.

5.5 Perceived Determinants of Bank Performance: Analysis of Survey Responses

Questions 16 to 19 in the survey questionnaire dwelt on the identification of major determinants of commercial bank performance in Nigeria, from the perception and belief of the respondents. They were required to rank these factors in order of importance. They were also to indicate the perceived relationship between bank performance and its major determinants, which they indicated.

From an extensive survey of previous studies on Bank performance among which are Fraser and Rose (1971), Fraser, Phillip and Rose (1974), Korobow and Stuhr (1975), Pantalone and Platt (1987), Hunter and Srinivasan (1990) and Simons and Cross (1991), the major determinants were classified into twelve (12) sub-groups. Implicitly, the actual determinants in terms of financial variables and ratios belong to these sub-groups. We have as the groups (i) Capital Adequacy, (ii) Asset Quality, (iii) Managerial Efficiency, (iv) Loan Portfolio, (v) Liquidity, (vi) Revenue Sources, (vii) Revenue Application, (viii) Ownership, (ix) Regulation/Deregulation, (x) Number and Distribution of Branches, (xi) Violation of Regulatory Guidelines and (xii) National Economic Variables. These sub-groups are not necessarily non-

overlapping. The literature is awash with different sub-groupings.

Table 5.5 shows the number and proportion of respondents that indicated that each of the factors were major determinants of bank performance. The responses by ownership is also given. More than 80 per cent of the respondents indicated that both asset quality and managerial performance (or efficiency) are major determinants of bank performance. About 67% of respondents noted the significance of capital adequacy and liquidity. For loan portfolio only 52% indicated its importance. Less than 40% of respondents indicated that the other factors were significant determinants of bank performance.

If one were to rank the groups of determinants in terms of their importance based on the proportion of respondents that selected them, managerial performance will be chosen as the most important. Ninety (90) percent of the respondents chose managerial performance as a major determinant of bank performance. Asset Quality follows with 81 percent. Both capital adequacy and liquidity place third followed by loan portfolio. Given the weights of other factors it is perhaps correct to say that they are likely to be insignificant in determining the performance of a bank. We notice that only 29% are of the view that ownership is a major factor in determining bank performance. In fact less than 50% of predominantly private and predominantly public banks hold this view. The least significant among them is the number and distribution of branches. Only 19% of respondents favoured this factor.

From Table 5.5 we observe that over 60% of the banks with predominantly domestic management support as the most significant determinants of bank performance the five factors earlier indicated. For less significant factors, less than 35% of this class of banks voted. Going by Head Office location, 92% of banks having their head offices in Lagos indicated asset quality and managerial performance as significant factors. A smaller percentage (75%) voted capital adequacy and liquidity as significant determinants of performance. An even smaller percentage (50%) voted for loan portfolio. Less than 35% voted for the significance of the other factors. Based on Lagos respondent banks only, both asset quality and managerial performance are equally important, followed by both capital adequacy and liquidity

Table 5.5: Ranking of Bank Performance Factors By Importance

Factors	OWNERSHIP										MANAGEMENT					HEAD-OFFICE LOCATION				TECH. PARTNERSHIP			
	NPU	%	PPI	%	PPI	%	WPI	%	SUM	RANK	%	FOR	%	DOM	%	LAG	%	OTH	%	YES	%	NO	%
Capital Adequacy	4	28	7	50	2	14	1	17	14	3	67	1	7	13	93	9	64	5	36	9	64	5	36
Asset Quality	5	29	7	41	2	12	3	18	17	2	81	1	6	16	94	11	65	6	35	11	65	6	35
Managerial Performance	6	32	7	37	2	11	4	21	19	1	90	2	11	17	89	11	58	8	42	12	63	7	37
Loan Portfolio	4	36	3	28	2	18	2	18	11	5	52	1	9	10	91	6	56	5	44	7	64	4	36
Liquidity	5	36	5	36	2	14	2	14	14	3	67	1	8	12	92	9	64	5	36	8	62	5	38
Revenue Sources	3	42	0	0	2	29	2	29	7	7	33	1	14	6	86	3	43	4	57	4	57	3	43
Revenue Application	3	42	2	29	1	15	1	15	7	7	33	1	14	6	86	4	57	3	43	4	57	3	43
Ownership	2	33	1	16	1	16	2	33	6	9	29	1	17	5	83	4	67	2	33	3	50	3	50
Regulation/Deregulation	3	38	1	12	1	12	3	38	8	6	38	1	12	7	88	4	50	4	50	2	75	2	25
Number & Distribution of Branches	2	50	1	25	0	0	1	25	4	11	19	0	0	3	100	2	50	2	50	6	67	1	33
Violation of Regulatory Guidelines	0	0	3	100	0	0	0	0	3	12	14	0	0	3	100	3	100	0	0	3	100	0	0
National Economic Variables	3	60	1	20	0	0	1	20	5	10	24	1	20	4	80	2	40	3	60	3	60	2	40

which are also equally important, followed by loan portfolio.

All respondent banks with head offices outside Lagos indicated managerial performance as a significant determinant followed by asset quality which was indicated by 75% of the banks. Of this class of banks 62.5% indicated each of capital adequacy, loan portfolio and liquidity as significant factors. Revenue sources and regulation/deregulation were voted significant by 50% of this class of banks.

Table 5.5 shows that 100% of all banks with technical partners indicated managerial performance as a significant determinant, 92% indicated asset quality as significant, while 75% of the banks voted for capital adequacy. Liquidity saw more banks of this group voting for it than loan portfolio. It is only in this case that we observe capital adequacy having a higher weight than liquidity. The preference for the factors revealed by the banks with no technical partnership arrangements, is in line with the preference indicated by the aggregate of the respondent banks.

So far we have based our ranking of the perceived importance of the factors on the proportion of respondents that indicated they were truly significant. The factors were then ranked from most important to least important. We had also requested the respondents to reveal the preference concerning the importance of the selected factors. Table 5.6 shows the number of respondent banks that associated the various priorities with the listed factors. The entries on the row indicate for each factor the number of respondents that associated with it (the factor) the associated priority.

Taking row one, therefore, we observe that five (5) banks placed capital adequacy at the first priority, while ten (10) placed managerial performance at this priority. Five (5) banks also placed liquidity at the first priority. One respondent bank indicated ownership as the first priority. Going by absolute majority, one would say that managerial efficiency is, among all the factors, the most important determinant of bank performance.

Column-wise, indeed taking the capital adequacy column as an example the entries indicate the number of respondents that gave the factor the associated rank or priority level. The majority of respondent banks rank capital adequacy as second

Table 5.6: Priority Ranking of Groups of Factors as Determinants of Bank Performance

Factors	Ranks=>												Total Score	Rank/ Priority
Capital Adequacy	1	2	3	4	5	6	7	8	9	10	11	12	20	2nd
Asset Quality	na	4	4	7	2	2	na	na	na	na	na	na	19	4th
Managerial Performance	10	5	2	2	na	1	1	na	na	na	na	na	21	1st
Loan Portfolio	na	1	4	2	6	3	3	na	1	1	na	na	19	5th
Liquidity	5	2	4	4	2	2	na	1	na	na	1	na	21	3rd
Revenue Sources	na	2	1	4	2	3	2	na	1	1	na	na	16	6th
Revenue Application	na	na	na	na	2	3	4	3	4	1	na	na	17	7th
Ownership	1	1	na	na	1	na	1	2	na	3	2	na	11	10th
Regulation/ Deregulation	na	na	na	na	1	1	2	1	1	3	3	na	12	11th
Number & Distribution of Branches	na	na	na	na	na	na	2	6	2	3	2	na	15	8th
Violation of Regulatory Guidelines	na	na	na	na	1	na	na	2	2	1	1	7	14	9th
National Economic Variables	na	na	1	na	na	3	2	3	1	3	1	2	16	12th

in priority or importance among the listed factors. For asset quality the majority voted it as the third most important factor. Again managerial efficiency is voted fifth. An interesting development occurs in the case of liquidity. The majority (5) ranks it as first priority. Four banks each rank it as third and fourth priority. Obviously it cannot be first, it cannot be second since capital adequacy has a higher vote, it cannot be fourth since majority rank asset quality as fourth and it cannot be fifth since loan portfolio has the highest vote in this respect. Also, it cannot be lower than the fifth priority. Given that it is equally ranked with capital adequacy, asset quality and loan portfolio at priority three (3) and these other factors are ranked by the majority at other different priorities, it implies that liquidity ranks third amongst the factors. Following the same argument and consideration revenue sources and revenue application rank 6th and 7th among the factors. The resulting ranks of the other factors are shown.

The ranking shows the first five most important variables to be the same with our earlier ranking based on proportions. The ranking is, however, quite different as Table 5.7 shows. Managerial efficiency ranks first, loan quality ranks third while loan portfolio ranks fifth, all in line with our earlier finding. However, asset quality which we ranked second was ranked fourth while capital adequacy which was ranked third (in most cases) with liquidity, is here ranked second. It seems however that this ranking is most appropriate, being a direct result of responses to a related question put forward in the questionnaire. Table 5.7 compares both rankings. The column marked 1 gives the frequency-based ranking while the second column marked 2 gives the ranking based on direct response to rank the factors.

Having identified the major determinants and marked them by their importance we also sought to know which of these factors are believed to be positively or negatively correlated with bank failure or better still, dismal bank performance and consequent vulnerability of banks.

From Table 5.8 we find that 71% of respondent banks believed managerial efficiency to be positively associated with bank performance. This means that the better the efficiency of management, the greater the likelihood of success of a bank.

Table 5.7: Comparison of Rankings of Bank Performance Factors

Factors	Ranking	
	Implied	Actual
Managerial Performance	1st	1st
Capital Adequacy	3rd	2nd
Liquidity	3rd	3rd
Asset Quality	2nd	4th
Loan Portfolio	5th	5th
Revenue Sources	7th	6th
Revenue Application	7th	7th
Number & Distribution of Branches	11th	8th
Violation of Regulatory Guidelines	12th	9th
Ownership	9th	10th
Regulation/Deregulation	6th	11th
National Economic Variables	10th	12th

Table 5.8: Survey Responses on Factors Positively Correlated with Bank Performance

Factors	MANAGEMENT				TOT	%	TECH. PARTNERSHIP				OWNERSHIP								HEAD-OFFICE LOCATION			
	DOM	%	FOR	%			YES	%	NO	%	WPU	%	PPU	%	PPI	%	WPI	%	LAG	%	OTH	%
Capital Adequacy	12	92	1	8	13	48	10	77	3	23	3	23	5	38	3	23	2	15	10	71	4	29
Asset Quality	12	100	0	0	12	57	9	69	4	31	4	33	5	42	2	17	1	18	6	55	5	45
Managerial Performance	14	93	1	7	15	71	11	69	5	31	5	33	5	33	3	20	2	14	9	64	5	36
Loan Portfolio	12	86	2	14	14	67	10	67	5	33	5	36	3	21	4	29	2	14	7	54	6	46
Liquidity	12	92	1	8	13	62	8	62	5	38	5	38	4	31	3	23	1	8	8	62	5	38
Revenue Sources	6	75	2	25	8	38	4	44	5	66	5	63	1	13	2	25	0	0	4	50	4	50
Revenue Application	8	88	1	12	9	43	6	60	4	40	4	45	2	22	2	22	1	11	6	67	3	33
Ownership	5	71	2	29	7	33	5	71	2	29	2	33	1	17	3	50	0	0	4	57	3	49
Regulation/ Deregulation	3	75	1	25	4	19	2	40	3	60	2	50	0	0	2	50	0	0	1	20	4	80
Number & Distribution of Branches	2	100	0	0	2	10	1	50	1	50	1	50	1	50	0	0	0	0	1	100	0	0
Violation of Regulatory Guidelines	3	60	2	40	5	24	4	57	3	43	2	40	1	20	2	40	0	0	3	50	3	50
National Economic Variables	4	80	1	20	5	24	1	17	3	83	4	80	0	0	1	20	0	0	1	17	5	83

Sixty-seven (67) percent and 62% of respondent banks view loan portfolio and liquidity respectively, as being positively associated with performance. Supposedly, the greater the portfolio of loans the greater the potential of success. Also, increased liquidity is felt to improve the probability of success of the banks. Asset quality is also highly favoured, at least relatively, as reflected by 57% of respondents. Other notable factors which are perceived to be positively related to bank performance are capital adequacy with 48% vote and regulation/deregulation with 43% vote. In this regard, it would mean that the greater the capital base of the bank, the higher the probability of success. The regulation factor would indicate that with more regulation, fewer banks are expected to fail. Thus, banking regulation is expected to aid in the prevention of bank failure. Though the other factors are also indicated, the number of respondent banks in these are negligible.

From table 5.8 over 67% of respondent banks with technical partners indicated that the first five factors are positively correlated with bank performance. Of those without technical partners 62.5% are of the view that managerial performance, loan portfolio, liquidity and revenue sources are positively associated with bank performance. Less than 50% of both classes of banks hold the view that the other factors are positively related to bank performance. It should be noted especially that less than 50% of banks without technical partners view capital adequacy as being positively associated with bank performance.

Similar observations hold when the respondent banks' preferences are examined in the light of their ownership structure as well as head office location. More than 62% of predominantly publicly-owned respondent banks view the first five variables as having positive association with bank performance. Banks with head-office located in Lagos have a similar orientation. The magnitude of votes for capital adequacy, managerial performance and asset quality as well as loan portfolio serve as substantial support that they are positively correlated with bank performance. Only fifty (50) percent of the banks favoured asset quality and revenue application as having positive correlation with bank performance. The other class of banks emphasise asset quality, managerial efficiency, loan portfolio and liquidity in

preference for capital adequacy and revenue sources. Sixty-two (62) percent of banks with head office outside Lagos indicate that national economic variables are positively associated with bank performance. The emphasis on this factor is most significant here than for any other class of respondent banks (Table 5.8).

Table 5.9 shows the proportion of respondent banks that indicated which of the determinants are believed to be negatively associated with bank performance. In particular, table 5.9 shows that regulation/deregulation and number and distribution of bank branches are most significant among factors that have negative correlation with bank performance. Seemingly, regulation when intensified could cause dismal performance among banks. Also, when the bank expands its branch network too fast it could lead to dismal performance. The indication of negative correlation in this respect would mean that indiscriminate or unstrategic bank branch expansion could promote dismal bank performance.

Of course, we do recognise that branch expansion in itself may not cause bank failure or dismal bank performance. However, when not objectively considered it could cause a decline in a bank's performance. In this regard we can consider the case with Nigerian banks. Under the Rural Banking Scheme, banks were compelled to open up branches in rural areas. In a three-phased programme that lasted about thirteen (13) years some banks were compelled to open over 200 rural branches. Firstly, it is doubtful that such banks would have embarked upon such branch expansion programmes in urban areas let alone in the rural areas of a developing country. The reason for this will be because the branches are unlikely to be commercially viable. Opening them, and in such a magnitude is capable of compromising the profitability of the bank. However, it is likely to have positive association or correlation with growth in the deposit base of a bank. Some studies such as Adama (1991) have shown however that these rural branches tend not only to operate at a loss, they also record overheads that are up to 40% of the deposit mobilized.

From the same tables we observe that 38% of respondent banks indicate capital adequacy, ownership, and national economic variables were negatively

Table 5.9: Survey Responses on Factors Negatively Correlated with Bank Performance

Factors	OWNERSHIP										TOT	%	HEAD-OFFICE LOCATION				MANAGEMENT				TECH. PARTNERSHIP			
									LAG				FOR				YES							
	WPU	%	PPU	%	PPI	%	WPI	%		%				OTH	%	%		DOM	%	%	NO	%		
Capital Adequacy	5	83	0	0	0	0	1	17	6	29	3	37	5	63	7	88	1	12	2	25	6	75		
Asset Quality	5	63	0	0	1	11	2	26	8	38	6	67	3	33	8	89	1	11	3	33	6	67		
Managerial Performance	3	50	0	0	2	33	1	17	6	29	4	43	3	57	5	71	4	29	4	57	3	43		
Loan Portfolio	4	66	0	0	1	17	1	17	6	29	4	43	3	57	6	86	1	14	2	29	5	71		
Liquidity	4	80	0	0	0	0	1	20	5	24	3	60	2	40	5	100	0	0	1	20	4	80		
Revenue Sources	2	40	1	20	2	40	0	0	5	24	4	80	1	20	3	75	1	25	2	50	2	50		
Revenue Application	3	44	1	14	1	14	2	28	7	33	6	85	1	15	6	86	1	14	4	57	3	43		
Ownership	6	74	0	0	1	13	1	13	8	38	5	63	3	37	7	88	1	12	2	25	6	75		
Regulation/Deregulation	4	44	2	22	2	22	1	12	9	42	5	56	4	44	9	100	0	0	5	55	4	45		
Number & Distribution of Branches	3	33	3	33	2	22	1	12	9	42	6	67	3	33	9	100	0	0	6	67	3	33		
Violation of Regulatory Guidelines	1	17	0	0	3	50	2	33	6	29	5	83	1	17	5	83	1	17	5	83	1	17		
National Economic Variables	3	37	1	13	2	25	2	25	8	38	4	50	4	50	8	100	0	0	5	63	3	37		

correlated with bank performance. With respect to national economic variables, a worsening of the general economic condition is expected to affect the performance of banks. With respect to ownership the lower the share of the government in a bank the higher the chance of survival. Notice that ownership here is viewed as whether the bank is predominantly public or predominantly private.

In the case of capital adequacy, the responses here can hardly be reckoned with, since a much higher percentage (57%) of respondent banks had favoured it as being positively associated with bank performance. Indeed, it will be quite difficult to comprehend that the higher the shareholders' funds of a bank the greater the decline in its performance. Viewed in isolation this may be the case. However, viewed against the background of other developments in the industry as well as within the bank itself, over time, this can happen. It may simply be an observed trend. For instance, no matter the capital base of a bank, if its management is highly inefficient and the quality of its assets poor, dismal bank performance will likely result. As expected the other factors are poorly rated as having negative correlation with bank performance.

Going by type of ownership, head-office location, management and technical partnership agreement, we observe here also that the lower proportion of the various classes of the banks voted the factors, except regulation and number and distribution of branches, as being negatively correlated with bank performance. The higher proportion favoured regulation and branch expansion as being negatively correlated with bank performance as shown in Table 5.10.

In summary, the larger proportion of banks voted capital adequacy, asset quality, managerial performance, loan portfolio, liquidity as being positively correlated with bank performance. The factors that are found to be negatively correlated with bank performance include regulation, number and distribution of branches, national economic variables, and ownership. Based on the responses the direction of relationship between revenue sources, revenue application, and violation of regulatory guidelines is not clear. Table 5.10 summarises the identified relationships.

Table 5.10: Perceived Correlation of Factors with Bank Performance

Factors	Correlation		
	Positive	Negative	Uncertain
Capital Adequacy	YES		
Asset Quality	YES		
Managerial Performance	YES		
Loan Portfolio	YES		
Liquidity	YES		
Revenue Sources			YES
Revenue Application			YES
Ownership		YES	
Regulation/Deregulation		YES	
Number & Distribution of Branches		YES	
Violation of Regulatory Guidelines			YES
National Economic Variables		YES	

Table 5.11 displays the responses of sample banks as to which of the factor(s) they believe is most significant in signalling possible bank failure. That is, which factor can be relied upon as an early warning aid in respect of bank failure. Ninety percent (90%) of the respondent banks indicated liquidity, 57% indicated asset quality, managerial efficiency and loan portfolio while 52% indicated capital adequacy. The other factors are insignificant, based on the proportion of respondent banks that indicated them, being less than 25% in all cases.

Examining the nature of the above response in the light of the previous ranking of factors in order of importance we observe the tendency to favour liquidity as one factor most significant for signalling bank failure. This development in this regard tends to reflect the orientation of bankers and management of banks in general, particularly since the adoption of the SAP. The fact is that the exchange rate was deregulated as a component of the SAP package while interest rate was also deregulated. These were consistent with the market forces orientation. These were followed by a considerable depreciation in the Naira value coupled with rising interest rates. To control this, the monetary authorities identified excess liquidity in the economy as the source and has relied on the compulsory issuance of stabilisation securities to mop up excess liquidity from the system. Indeed, since 1987 liquidity mop-up has been a major preoccupation of the CBN and consequently gained the attention of the operating banks. The National Bank problem began due to illiquidity and it has since been expelled from the clearing house as a result. It is necessary to mention, however, that the problem of illiquidity which crippled this bank started largely with the poor quality of its assets. The peculiar case of the bank is discussed in a subsequent chapter for its significance as perhaps the only Nigerian commercial bank which has come very close to failing in recent times. Lately the Central Bank of Nigeria formally announced its take-over of the Bank, with the subsequent turning over of its management to the Nigerian Deposit Insurance Corporation (NDIC).

Table 5.11: Survey Responses on the Most Important Bank Performance Factors

Factors	MANAGEMENT				TOTAL	% of RESPONDENTS
	FOR	%	DOM	%		
Capital Adequacy	11	100	0	0	11	52
Asset Quality	11	92	1	8	12	57
Managerial Performance	11	92	1	8	12	57
Loan Portfolio	11	92	1	8	12	57
Liquidity	18	95	1	5	19	90
Revenue Sources	5	100	0	0	5	24
Revenue Application	1	50	1	5	2	10
Ownership	3	75	1	25	4	19
Regulation/Deregulation	1	100	0	0	1	5
Number & Distribution of Branches	0	0	0	0	0	0
Violation of Regulatory Guidelines	4	80	1	20	5	24
National Economic Variables	1	100	0	0	1	5

5.6 Regulatory Authorities, Regulatory Guidelines and Bank Performance: Analysis of Survey Responses

We examine in this section the views of the sample banks as they concern whether or not regulatory authorities should help prevent bank failure, the variety of reasons for the views expressed, and also whether bank failure could result in Nigeria from consistent violation of key monetary guidelines. These include the cash ratio, liquidity ratio, capital adequacy and sectoral credit allocation ratios. Also, indications were requested as to which guidelines of the monetary authorities are believed to be beneficial and those detrimental to commercial bank performance in Nigeria.

From Table 5.12 we find that 70% of sample banks share the opinion that the CBN should help protect and prevent bank failure in Nigeria. Only 30% share an opinion opposite to this. The majority of banks favour CBN preventing bank failure as part of their regulatory functions. Of the wholly public banks, 75% are in favour of CBN preventing bank failure. The vote in support of this view is 80% for predominantly public banks, 67% for predominantly private banks.

Respondent banks with head offices in Lagos support the opinion that CBN should prevent bank failure, going by the 67% response in this regard. The banks with head offices outside Lagos are also in favour, going by the 75% support. Sixty eight percent (68%) of domestically managed banks support the view just as the only foreign managed bank. Based on the existence or non-existence of technical partnership agreement, we find that 58% of those banks with such agreements favour the opinion which is equally favoured by 88% of banks without. A significant proportion of banks with technical partners seem not to share the opinion that CBN should prevent bank failures. Given the closeness in response rate for and against the opinion it is difficult to say that an obvious preference exist in this regard for banks with technical partnership arrangements. In what follows we highlight the reasons which sample banks have given, looking at those which support prevention of failure and those that are against.

Among the banks in favour of prevention, the arguments revolved around the need to maintain and enhance the trust and confidence of depositors in the banks.

Table 5.12: Survey Responses on Prevention of Bank Failure By CBM

Factors	OWNERSHIP								TOT	%	HEAD-OFFICE LOCATION				MANAGEMENT				TECH. PARTNERSHIP			
	WPU	%	PPU	%	PPI	%	WPI	%			LAG	%	OTH	%	FOR	%	DOM	%	YES	%	NO	%
Prevent Failure	6	75	4	80	4	67	0	0	14	70	8	67	6	75	13	68	1	100	7	58	7	88
No Prevention	2	25	1	20	2	33	1	100	6	30	4	33	2	25	6	32	0	0	5	42	1	12
Total	8	100	5	100	6	100	1	100	20	100	12	100	8	100	19	100	1	100	12	100	8	100

The prevention of bank failure, as indicated by one of the three largest banks, will generate a lot of confidence not only on the part of depositors but also, and importantly too, enhance confidence on the part of local and international investors. This is felt to be all the more necessary as the industry is still growing and consequently any development that could endanger the trust reposed in it by depositors should be avoided. This is due to the fact that, as pointed out by yet another bank in support of the opinion, at this stage of the economy's development, bank failure would have a *bandwagon effect* which could affect negatively, the evolving banking habit and culture. Individual failures would weaken or, at least to some extent, destabilize the entire financial system.

There is also this view that as the banker of all banks or better still the *lender of last resort* the CBN is expected to do anything that will forestall the erosion of public confidence in the banking system. It is also expected to protect the depositors' funds and if it is observed that failure of a bank is inevitable, it should minimize the loss associated with such failure. This has the potential of cushioning the *bandwagon effect* that may arise.

Finally, an important point is believed to have been made by one of the wholly private owned banks. Pointing out that protection and prevention of bank failure need not be limited to assistance at the point of failure, it views that policies that aim at preventing failures should be put in place by the monetary authorities. The CBN rules and guidelines should be more preventive and equally protective while banking supervision should be made more meaningful and effective.

One assumption that runs through all the viewpoints of this set of banks is that the CBN is capable and has the capacity to protect and prevent failure. If this is the case, one wonders then why the problems of the state-owned bank mentioned earlier were not detected earlier. The structure of the balance sheet of the bank over the years as well as its profitability, if adequately examined, would have revealed the true state of the bank. For it to have run into the kind of problem it finds itself in today, it could not have occurred overnight. Perhaps, this formed the basis of the view that banking supervision should be more meaningful and effective. The bank has

not failed due only to the fact that it is government-owned. Also, in Nigeria, CBN examiners carry out inspections on banks annually. One expected they should have known the state of things and consequently raised an alarm and set the correction process in motion.

The case of a multinational bank, Bank of Credit and Commerce International, BCCI, whose affiliate in Nigeria recently changed its name and which belongs to our sample of banks, and the Bank of England is still fresh. The Bank of England appeared to have insufficient information about the happenings in this bank. Also, in China, the government had advised depositors not to withdraw their funds from BCCI in the wake of the developments in other parts of the world. The next day after the announcement the government itself closed down the bank.

The need for a further elaboration on the response of the management of National Bank of Nigeria Limited is desirable. A bank failure is considered an indication of the inability of the monetary authorities to correctly diagnose the crucial problems in good time to avert such failure. The response continued by maintaining that *monetary authorities can hardly be fully exonerated from blame for watching the situation deteriorate. Neither could they be exonerated for ineffectively trying to deal with whatever the problems might have been for so long as to defy solution, given the preventive and curative sanctions available under the appropriate regulations and guidelines to assist a troubled bank in overcoming its problems before degenerating into a compounded and hopeless situation.* Again, we believe the comment presumes that the CBN is capable of preventing failure. It tends to portray in this case, however, that the CBN must have known long before this time that the Bank was in serious trouble and yet nothing was done to avert it when there was still ample time.

The views of the opposing banks are equally interesting. Many are based on the recent development in the industry wherein more than 80 new banks have started operation since the adoption of SAP. The central argument against prevention of bank failure by CBN is that it will promote and sustain inefficiency in the banking industry. This in their view is contrary to the new market orientation. It seems they believe that the essence of the keen and increasing level of competition that has been

on since SAP is to *sort the wheat from the chaff*. Only efficient banks should be allowed to operate. The argument for deregulation is one for efficiency of the banking system in particular and the financial system in general. No protection/prevention policy, one bank rightly observes, has the potential of making the banks sit up, ensuring higher degree of professionalism in decision making by the board of directors and management of most banks as well as causing the public to be more cautious in choosing a bank. One bank distinguishes the protection of depositors' interest by law from the prevention of bank failure. While being in favour of the former the bank is vehemently against the latter, as can be seen from its response. It holds that protection, apart from fostering inefficiency, will encourage *avoidable* and *unnecessary* risk taking by banks.

The pre-eminence of *collective* rather than *individual* survival is reflected by one of the opposing banks. The bank proffers a solution which may be considered one of a *compromise* nature. This is that rather than prevent bank failure on an individual basis, it should be prevented by encouraging take-overs by other well-managed and performing banks, since the collective survival is more important.

From the views of this group of banks we identify two crucial points. First is that the prevention of bank failure is or can be distinct from protection of depositors interests, while the second is that banks may not be allowed to actually fail by recognising and putting in place a framework that encourages take-overs by other sound banks. It is noteworthy that both seem to have taken care of two key issues raised by the class of banks that favour prevention of bank failure. One issue is that of protecting the depositors interest. Granted that a bank may fail while its depositors are protected then perhaps there may be no need for deliberate efforts at preventing bank failure, at least when viewed ordinarily. On the other hand, however, with too many of such developments, we may begin to see the trust and confidence depositors have in the industry being eroded. A decline in banking habit would result, and for an economy that is making efforts at harnessing a larger amount of financial resources, particularly from the rural areas, this development would have a negative impact.

The other issue has to do with the ability of the CBN to protect the banks and prevent bank failure. In line with the suggestion that this objective can be achieved by putting in place rules and guidelines, these may be geared towards establishing the framework that will encourage and promote take-overs. In all these we have not in any way attempted to play down the importance of bank supervision. This is still very essential to the extent that it will ensure that banks' operations are in line with regulations.

In response to whether or not the persistent violation of a number of CBN monetary policy guidelines would eventually lead to bank failure, 71% of the banks responded positively to the cash ratio and 81% responded positively to both the liquidity and capital adequacy ratios. Only 50% responded positively to the sectoral allocation ratio.

One can appreciate the basis for this view. While the cash, liquidity and capital adequacy ratios relate directly to the operations of the bank and are precautionary measures aimed at either protecting the depositors or guiding the banks' performance, the sectoral credit allocation ratios represent government policy aimed at achieving diversification in the administration of credit, in particular toward the real sectors or so-called *high priority* sectors. The sectoral credit allocation policy stipulates that a minimum of 15% and 35% respectively, of the aggregate credit of each bank be directed at activities in the agriculture and manufacturing sectors. What the response seems to be indicating is that, while in complying with this restriction some income may be compromised, this need not be to the extent that would adversely affect a sound bank. Consequently, if violated it must imply that more credit has been directed to the non-preferred sectors which include exports, wholesale and retail trade as well as transport among others. The credit to this sector is conventionally priced higher than those to the priority sector, particularly, Agriculture. Hence, some benefits may actually be derived from a violation in this case. The high price as well as the high repayment rate are pluses that may promote such development. There is a penalty, however, which states that in the event of a violation the bank would deposit an amount equivalent to the shortfall at the CBN

for three months in the first instance and without interest. A study has, however, shown that it may be more profitable for banks to deliberately violate the restriction since the returns from its violation can exceed considerably the penalty paid (Alejo, 1988).

Some interesting responses were noticed among the general responses. Four respondent banks held the view that a persistent violation of all the guidelines would not cause bank failure. Of these, two banks felt that not even the liquidity ratio nor the capital adequacy ratio were critical enough to cause bank failure if persistently violated by banks. Perhaps, the fact that the question stated *would eventually lead to bank failure* brought about these views. However, one would find it difficult to comprehend the view that a persistent violation of these guidelines in particular would not increase the *probability* of bank failure. When asked to indicate which CBN policies were beneficial to bank performance, however, one indicated *increasing emphasis on capital adequacy* while the other cited liquidity, cash and capital adequacy ratios. Given these replies one then wonders whether there is not a contradiction. If the guidelines which are put in place by the CBN and which are meant to be followed by the banks are thought to aid bank performance, it stands to reason that a lack of adherence to them would tend to compromise bank performance.⁴

One of these banks represents a state-owned non-performing bank with head-office located outside Lagos, a domestic management without a technical partnership agreement. One cannot help thinking that in preparing their response to this question the management was informed by the circumstances that lead to its own dismal performance. If indeed the violation of these guidelines had little to do with their performance then one can appreciate their comments.

⁴ It is thought that perhaps banks should be allowed to decide their own liquidity levels, in line with the policy of deregulation, as it is done in U.K. for example. The current state of affairs may, however, not be unconnected with our relatively inadequate experience in banking, and the level of development of the economy.

One other represents a fairly new bank with excellent performance. Two others are older predominantly government owned banks. One can only view their responses as being inconsistent with their answers to subsequent questions.

Table 5.12 summarises the guidelines of the CBN which the respondent banks felt to be beneficial to bank performance. In this regard, 62% of the banks indicated the beneficial nature of the liquidity ratio while capital adequacy ratio was voted beneficial by 76% of the banks. The cash revenue requirement or cash ratio is beneficial according to 33% of the banks.

Some other important guidelines, which were thought to be beneficial include; the prudential guidelines, sectoral credit allocation, interest rate policy, new branch opening policy, equipment leasing guidelines, equity participation, ceiling on aggregate credit, the deregulation of foreign exchange and the uniform accounting standards among banks. The prudential guidelines were put in place to ensure a uniform standard which were to be used by banks to make provisions for loan losses and other non-performing assets. This policy came into force in November 1990. We earlier explained the focus of the sectoral credit allocation policy. The interest rate policy borders on the deregulation of interest rates wherein banks had the free will to fix rates based on demand for credit. With respect to new branch policy, the CBN is expected to appraise applications for location of new branches. Also, commercial banks are now allowed to engage in equipment leasing to the tune of 15% of their aggregate assets. The deregulation of foreign exchange rate is similar to the interest rate deregulation. The Naira exchange rate is now determined by the interaction of demand and supply forces at the foreign exchange market in which the CBN is the sole supplier of foreign exchange and the licensed banks are the only authorised dealers. The uniform accounting standard is similar to the prudential guidelines in their objective. We do not intend to go into details of these guidelines for their seemingly insignificant relevance.

Among the guidelines believed to be detrimental to bank performance, as cited by the respondent banks, we have: the mopping up of excess liquidity or compulsory issuance of stabilisation securities; aggregate credit ceiling; rural banking

policy; foreign exchange allocation; sectoral credit allocation; interest payment on current accounts; tax on savings deposits; and frequency of changes in regulation and liquidity management.

Four banks hold that the sectoral credit allocation policy were beneficial to bank performance while only one voted otherwise. Quite a number of banks detest the aggregate credit ceiling. This disposition need only be appraised within the new economic policy orientation. Banks had expected that with deregulation all credit controls would be removed. To date, however, this has not materialised as the ceiling is still stipulated while in addition there is the sectoral credit allocation. There is little room for banks to manoeuvre, hence the change being observed in their asset structure away from lending and interest income to fee income activities (Sotonwa, 1991)

The rural banking policy has been cited earlier. Foreign exchange allocation has been raised here as being distinct from the deregulation of foreign exchange. It seems that the problem here has to do with the method of allocating available foreign exchange at the foreign exchange market. Successful banks at the market get a fixed amount of foreign exchange irrespective of the level of demand. The identification of the frequency of changes that have plagued the industry since SAP makes the management of the assets and liabilities of banks more difficult with the tendency for banks to be exposed to greater risk. Furthermore, this situation may cause banks to be more conservative, a disposition which is likely to involve a compromise in bank performance. Finally, the payment of interest on current account which is made compulsory was decried by quite a number of banks.

5.7 Influx of New Banks and Bank Failure: Analysis of Survey Results

The concluding part of the questionnaire sought to isolate the views of the banks and their management as to whether or not they are in support of the view that the recent influx of new banks into the industry may result in bank failure or a decline in the performance of banks.

Among the respondent banks, 60% do not agree that the influx of new banks

will result in failure, while 40% hold a contrary view. Also 60% of banks with head offices in Lagos do not believe that bank failure would result from the increase in the number of banks. Same is the view of 58% of banks with technical partnership agreements as well as 61% of banks with domestic management. A half of the banks with head office located outside Lagos each voted for and against the view.

The reasons for the pros and cons regarding the view are considered in what follows. First, we consider those of the banks that believe that there will be bank failure as a result of the influx of new banks. In general while some view that any existing bank could fail others believe that the failure would be among the new banks only. One of these banks claims that the current state of the Nigerian economy does not require an influx of more banks and that if at all new banks were to be allowed, only a few new ones which can be piloted effectively in conjunction with the existing ones would suffice.

Some others did indicate that the influx would increase the competition among banks and this may in turn lead to failure of inefficient banks that cannot survive the competition. One, in particular, stated that only banks with a reasonable market share would survive. What is not known here is the definition of *reasonable* market share.

It is also the view of this category of banks that the new banks in particular lack competent staff and professional bankers; are in most cases personalised with incessant occurrence of board squabbles; are over-reliant on foreign exchange trade as a source of income; while they also have high potential for frauds arising from control inadequacies. The quality of bank staff as well as that of the management team is emphasized here as being a potential cause of failures. Bank failures are also capable of resulting due to the fact that adequate CBN supervision is doubtful. The expansion in the industry if too rapid may pose supervision problems to CBN. Consequently bank failures may result.

Respondents in the opposing group view among others that banks will not necessarily fail if they are properly monitored, although there will be increased competition which will enhance efficiency and innovativeness. A role is carved out for the CBN, which emphasises the essence of proper management. It seems that

emphasis is being placed on the supervisory role of the CBN. These banks also believe that opportunities abound in the industry that can be exploited. There is still unsatisfied demand for banking services. This is contrary to the claim earlier made by management of some opposing banks that the economy cannot afford additional banks, at least not as many as we now have. It is also pointed out that with adequate database, what really is believed to be needed is the licensing of more commercial banks in preference for merchant banks. The important points that are made by the banks are that (i) the free entry of new banks was not designed primarily to precipitate bank failures but to enhance efficiency, improve funds mobilization and meet unsatisfied demand; and (ii) that the existing number of banks is not a factor in bank failure.

A bank in particular noted that the new banks will not fail due to the fact that they possess a dynamic crop of management personnel mostly selected from well established older banks which have spent fortunes training them. They are highly innovative, building up high quality of assets and have minimal overhead expenses. It is noted also that with the influx of banks the industry risk will be spread even more. These views make sense though some of the opposing banks which believe that new banks will fail claim they have poor management which are mostly inexperienced. Quite frankly a number of them are doing well from an examination of their profitability and asset structure and quality (Sobodu and Sotonwa, 1991). Those that are malperforming, more often than not, have boardroom crises or some management squabbles as has been rightly pointed out by the banks.

Finally, it is necessary to examine one interesting response from one of the banks that believes bank failure would not result. The bank's reason for its position is based on its claim that present regulations indirectly subsidize banks and it is this subsidy that causes the influx of new banks into the industry. The bank claims that it is only when banks are allowed to compete on their own merits, by withdrawing the subsidies, that failure could result.

In effect the bank seems to be claiming that the CBN has thus far put in place policies that are geared toward protecting and preventing bank failure. The bank had

earlier held a mid-way view about whether or not the CBN should help to protect or prevent bank failure. Some comments seem necessary at this point.

One finds it difficult to see current banking regulation as a subsidy in its orientation. Perhaps the subsidy refers to the price of official foreign exchange, compared with the parallel market rate, which appears to be more responsive to market forces. The same bank had been the only one among all the respondent banks which cited as a detrimental guideline of the CBN, the method of allocating foreign exchange. A closer look at the method of allocation at the FEM reveals that each authorised dealer or bidding bank can be sure of an almost constant income once it is successful. At the FEM the maximum amount of foreign exchange which a bank can buy depends upon its category. At the early stages of the functioning of the market, banks were classified into big, small and new banks with each having a ceiling on the quantity of foreign exchange it could purchase. The categorisation, the basis of which was not particularly clear to the bidding banks, had been changed a few times. Up to March 5, 1992, five categories of banks existed with associated foreign exchange purchase limits. The market was fully deregulated on March 5, 1992.

The obvious flaw in the previous arrangement was that the quantity each bank obtains from the market was fixed. This left little room for the price of foreign exchange to be a true reflection of its worth. The fact that some banks could be sure of foreign exchange and hence income on a constant basis by virtue of the allocation method was, admittedly, a subsidy. The view was infact widely held that the larger majority of the new banks relied significantly on income from foreign exchange sources. It had turned out to be such a constant source of considerable income. For some of these banks, income from foreign exchange has accounted for over 30 per cent of their total operating income. Consequently, without foreign exchange many of the banks that have minimally diversified portfolio of assets would be exposed. The point being made here therefore seems to be that the foreign exchange arrangement was a policy that served to sustain banks without any reference to their efficiency. The consensus is that the new scheme is by far better and more efficient.

CHAPTER SIX

RESULTS OF UNIVARIATE ANALYSES

6.1 Introduction

This chapter relies heavily on the quantitative information provided in the questionnaires. This information covers the number of urban and rural branches, the number and composition of staff, the magnitude and composition of the loan portfolio, the magnitude and composition of operating expenses, the magnitude and composition of the deposit portfolio, operating income and bank capital among others. Essentially, the information provided was requested for the period 1980 to 1989. The reason for this is that the more the information available the greater is the potential level of accuracy that can be achieved and the greater our ability to check for the internal consistency in the data. The period was also stated deliberately to provide considerable information prior to SAP and since SAP, to enable comparison of the results along this line.

On close examination, only about seven (7) respondent banks provided comprehensive quantitative information for periods prior to 1985. The observed trend was such that the longer the period the greater the scanty nature of the data. Also, some banks only began operation in the mid-80s and quite obviously did not have information for the years prior to 1985. Given the state of the data, we decided to concentrate on the period 1985 to 1989. This period still provides us with the opportunity of comparing the results obtained for the years prior to SAP and the periods since SAP.

Also, there are instances in which one or two data points are missing in the data available for 1985 to 1989. The analysis is thus based on the available data points in all cases. This, as well as the above situation, imposes some limitation on the results of our analyses and the extent to which we can generalise as a result.

Due essentially to the large differences in the size of these respondent banks measured in terms of the deposit base, the asset base, the loan portfolio, the capital

base, as well as such factors as age and ownership, we concentrate on certain financial ratios to make for effective comparative analysis among the banks. The financial ratios which are identified and highlighted were compiled from a wide variety of sources which include Deakin (1968), Meyer and Pifer (1970), Fraser, Phillips and Rose (1974), Korobow and Stuhr (1975), Sinkey (1975), Sinkey and Walker (1977), Hunter and Srinivasan (1990) and Pantalone and Platt (1987).

These ratios are grouped under a number of headings that describe their essence and scope. They are (i) Profitability, (ii) Liquidity, (iii) Capital Adequacy, (iv) Risk/Asset Quality/Loan Volume, (v) Management Efficiency, (vi) Match of Liability and (vii) Bank Size/Bank Branch Structure/Revenue Sources. These headings are informed by the previous attempts in the literature. In addition to the more conventional ratios we also add a few ratios that we believe will reflect more of the peculiar characteristics of the banking industry in a developing economy. These ratios are related to the number and distribution of bank branches and the staff size.

The 37 financial ratios used are listed as follows:

A. Profitability

1. $\frac{\text{Net Income Before Taxes}}{\text{Total Assets}}$ =NITA
2. $\frac{\text{Net Income Before Taxes}}{\text{Total Capital}}$ =NITC
3. $\frac{\text{Operating Income}}{\text{Total Assets}}$ =OITA
4. $\frac{\text{Operating Income}}{\text{Total Capital}}$ =OITC
5. $\frac{\text{Net Income Before Taxes}}{\text{Staff Size}}$ =NISS
6. $\frac{\text{Operating Income}}{\text{Staff Size}}$ =OISS
7. $\frac{\text{Operating Income}}{\text{Number of Branches}}$ =OINB

8.	$\frac{\text{Operating Income}}{\text{Number of Rural Branches}}$	=OIRB
B.	Liquidity	
1.	$\frac{\text{Total Loans}}{\text{Total Deposits}}$	=TLD
2.	$\frac{\text{Cash and Short-Term Funds}}{\text{Total Assets}}$	=CSTA
3.	$\frac{\text{Government Securities Holding}}{\text{Total Assets}}$	=GSTA
C.	Capital Adequacy	
1.	$\frac{\text{Total Capital}}{\text{Total Assets}}$	=TCTA
2.	$\frac{\text{Total Loans}}{\text{Shareholder's Funds}}$	=TLSF
3.	$\frac{\text{Total Capital}}{\text{Risk Assets}}$	=TCRA
4.	$\frac{\text{Total Loans}}{\text{Shareholder's Funds} + \text{Loan Loss Provision}}$	=TLCLL
D.	Risk/Asset Quality/Loan Volume	
1.	$\frac{\text{Total Loans}}{\text{Total Assets}}$	=TLTA
2.	$\frac{\text{Loan Loss Provision}}{\text{Total Loans}}$	=LLTL
3.	$\frac{\text{Risk Assets}}{\text{Total Assets}}$	=RATA
4.	$\frac{\text{Current Assets}}{\text{Total Assets}}$	=CATA
5.	$\frac{\text{Loan Loss Provision}}{\text{Operating Expenses}}$	=LLOE

E. Management Quality/Managerial Efficiency

1. $\frac{\text{Operating Expenses}}{\text{Operating Income}}$ =OEOI
2. $\frac{\text{Operating Expenses}}{\text{Total Assets}}$ =OETA
3. $\frac{\text{Operating Expenses}}{\text{Total Capital}}$ =OETC
4. $\frac{\text{Operating Expenses}}{\text{Risk Assets}}$ =OERA
5. $\frac{\text{Operating Expenses}}{\text{Staff Size}}$ =OESS
6. $\frac{\text{Operating Expenses}}{\text{No. of Branches}}$ =OENB
7. $\frac{\text{Operating Expenses}}{\text{No. of Rural Branches}}$ =OERB
8. $\frac{\text{Total Dividend}}{\text{Total Income}}$ =DVOI

F. Match of Liability

1. $\frac{\text{Time Deposits}}{\text{Current Deposits}}$ =TDCD
2. $\frac{\text{Time Deposits}}{\text{Total Deposits}}$ =TDTTD
3. $\frac{\text{Cash and Short-term Funds}}{\text{Current Deposits}}$ =CSCD
4. $\frac{\text{Cash and Short-term Funds}}{\text{Current + Savings Deposits}}$ =CSCSD
5. $\frac{\text{Total Loans}}{\text{Current Deposits}}$ =TLCD

G. Bank Size/Bank Branch Structure/Revenue Sources

- | | | |
|----|---|--------|
| 1. | <u>Loan Income</u>
Total Income | =LIOI |
| 2. | <u>Total Deposits</u>
No. of Branches | =TTDNB |
| 3. | <u>Total Deposits</u>
Staff Size | =TTDSS |
| 4. | <u>No. of Rural Branches</u>
No. of Urban Branches | =RBUB |

A number of these ratios are widely used in the U.S. for assessing bank performance and indeed there exists some norms or benchmarks for these ratios which aid in the assessment of the health of operating banks. In our review of ratios for which widely accepted norms exist, we also examine averages for all or a representative of U.S. commercial banks of other ratios as benchmarks for adequate performance. This is believed to be applicable since inspite of the spate of failures in the U.S. banking system, more than eighty percent of operating banks are not problem banks. We have not reviewed the norms for all ratios due to the fact that some have been introduced only in this study especially to reflect the peculiarities of our case study.

The return on assets among U.S. commercial banks is observed to vary with the banks' asset size. For banks with asset base of less than \$500 million, the acceptable range for the non-problem banks is between 1.25% and 1.50%. Those with assets ranging between \$500 million and \$2 billion tend to exhibit a lower ROA of between 1.00% and 1.25%. For banks recording assets in excess of N2 billion, an ROA of between 0.5% and 1.00% is deemed adequate (Johnson and Johnson, 1984). Fraser and Fraser (1990) indicated that for all U.S. banks insured by the FDIC, the average ROA was 0.78%, 0.75%, 0.72%, and 0.71% in 1983, 1985, 1987 and 1989 respectively. For all U.S. banks, the ROA was 0.75%, 0.89%, 0.99%, 0.55% and 1.02% in 1986, 1987, 1988, 1989 and 1990 respectively (French, 1991, p.7). The

profitability of banks not insured by the FDIC seems responsible for the increased average profitability of the U.S. banks. Indeed, French (1991) also indicated that banks with capital ratios in excess of 6.0% (which is considered the norm), were more profitable. For this class of U.S. banks, the average ROA was 0.96%, 0.96%, 1.06%, 1.07% and 1.07% respectively in 1986, 1987, 1988, 1989 and 1990. Our net income to total assets ratio measure of profitability is considered a good proxy for the ROA. A return on total capital of between 13% and 16% is considered adequate for a U.S. bank (Johnson and Johnson, 1984). Between 1978 and 1982, for all U.S. banks, the return on capital employed averaged between 12 % and 14%.

Our liquidity ratios include the ratio of total loans to total deposits, cash and short term funds to total assets and government securities holding to total assets. According to Johnson and Johnson, a bank with a loan-asset ratio in excess of 75% is considered to have an aggressive loan strategy while one with a ratio that is at most 65% is considered to operate a very conservative loan strategy. The Federal Reserve Bank of Chicago (1984) revealed the average loan-asset ratio of all U.S. banks to be 60.5%. For Hunter and Srinivasan's (1990) sample of 169 U.S. commercial banks, the ratio was between 66% and 67% over the period 1981 to 1988. For a sample of 130 commercial banks representative of the U.S. banking industry, Johnson and Johnson revealed that the ratio of cash and short-term assets to total assets averaged between 15% and 19% over the period 1973 to 1982. Indeed, while the holding of cash has declined, the holding of government securities has been on the increase, both in relation to assets. Sinkey (1975) observed that liquidity measured by the same ratio was higher for surviving banks. The holding of government securities in relation to total assets has grown, based on this sample, from about only 3% in 1973 to about 11% in 1988. This ratio averaged 12% to 15% for a sample of problem banks and 17% to 18.5% for a control sample of non problem banks in 1970 -72 as presented in Sinkey and Walker (1974). In Short et al's (1985) analysis of bank failures, failed banks were found to have recorded on the average a ratio of 5.5% as against 10.7% for non-failed banks in the 1982/83 period. Again we observe that the healthier banks would seem to be more liquid than the problem banks.

The Federal Reserve guidelines indicate a capital-asset ratio of 7% as being appropriate for most U.S. banks. For practical purposes however, a ratio of between 5% - 6% is considered adequate for money-center banks and regional banks. The capital-asset ratio for all U.S. banks in 1984 averaged 9.2% (FRB Chicago, 1986, p. 49). Short et al (1985) also adopted this ratio in their analysis. For the period 1982/83, they observed an average ratio of 6.62% for a sample of failed banks and 10.29% for a sample of non-failed banks. Failed banks had relatively lower capital-asset ratios compared with non-failed banks, at least in the U.S. Sinkey used the ratio of loans to equity capital plus reserves as an alternative ratio for assessing capital adequacy. He observed on the average for surviving banks that loans were between 5.5 and 5.8 times the shareholders' funds for the period 1970 to 1972 and indicated that the average for failed banks was much higher. The ratio of capital to risk assets was also penciled down for assessing bank capital adequacy in our study. An appropriate ratio, going by the capital-asset ratio considered, would be in the range of 10% to 12%. For problem banks, the ratio used by Sinkey and Walker (1974) averaged between 9% and 12% while for the control sample banks the ratio averaged at least 12.5%.

The loan-asset ratio, a measure of risk and diversification, averaged between 52% and 56% for a sample of 130 U.S. commercial banks between the ten-year period 1973 and 1982 (Johnson and Johnson, 1984). Short et al (1985) found that the ratio for a sample of failed banks averaged 70% in 1982/83 as against 58% for non-failed banks. We have used as a proxy for the asset quality measure of non-performing assets to total loans, the ratio of loan loss provision to total loans. A bank with a ratio of non-performing assets to total loans of less than 3% is deemed to exhibit above average asset quality while those with higher ratios are cases which call for concern (Morgan Bank, 1986)⁵ The sample of commercial banks considered by Johnson and Johnson would suggest that a risk-asset ratio of 84% - 85% is deemed adequate for a U.S. commercial bank. This average ratio was observed with

⁵ Morgan Bank (1986) "Bank Analysis", mimeograph, october.

very little variation for the ten-year period 1973 and 1982. The same sample indicated as an acceptable benchmark a loan loss provision to operating expenses ratio of between 2% and 4%. Around late 1972 the ratio tended more towards 4% while since the early 1980s a marked reduction towards 2% was observed.

In spite of the popularity of the ratio of operating expenses to operating income as a measure of managerial efficiency, it does appear that no specific percentage is deemed appropriate. However, an attempt to compare any two banks would suggest that the one with the lower ratio is more managerially-efficient. Sinkey in his 1975 paper obtained an average ratio of less than 80% for non-problem banks and more than 80% for problem banks. Another ratio for measuring managerial efficiency is the ratio of operating expenses to total assets. A closely related ratio is the ratio of overheads to total assets. According to Johnson and Johnson, as at 1984, a ratio of less than 3% was considered low while a ratio in excess of 5% was considered high. We also have as a measure of managerial efficiency the ratio of dividends to total income. A closely related ratio is the ratio of cash dividends to net income which should be between 30% to 40% for a performing bank.

The ratio of time to total deposits would reflect the degree of dependence of a bank on high cost and long term funds. For a retail bank this ratio is expected to be low while for a wholesale bank it stands to reason that it should be high. Hunter and Srinivasan adopted this ratio in their analysis of newly chartered U.S. banks. Between 1981 and 1988, they observed a reduction in the average ratio for a sample of 169 U.S. banks from 31% in 1981 to 21% in 1985 and further to 17% in 1988. This would suggest an increasing reliance on other types of deposits over time.

An assessment of the income profile of the earlier referenced sample of U.S. commercial banks revealed that between 1973 and 1982, total interest income accounted for between 88% and 92% of their total income. Indeed, Sinkey and Walker's (1974) study showed that loan income accounted for between 60% and 70% of the total income of U.S. banks. It may be right to use as a benchmark a 60 - 70% contribution of loans to total income especially when loans constitute the bulk of the assets of banks and have equally constituted the most profitable asset of banks.

In what follows we compute the financial ratios and discuss the trend observed among banks for each year of the study horizon as well as conduct a comparative analysis over the study period. We have not attempted an explicit comparison of the ratios observed for Nigerian commercial banks with the benchmarks and norms for the U.S. banks. As noted by Morgan Bank (1986), side-by-side comparisons of banks in different countries are not always analytically meaningful, and substantial adjustments may be necessary to effect some measure of uniformity. For example, different financial classifications exist which are in use in different countries. The accounting standards differ just as the demands of the regulatory authorities as regards financial reporting. With the pioneering work of the Basle committee in defining a uniform international capital adequacy ratio, perhaps in the near future, with greater international cooperation, a good basis may exist for inter-country comparison. Furthermore, some U.S. banks have limited branching status. Categorising them with those having unlimited branching status in reporting of aggregate financial information on banks in the U.S. would not make for reasonable comparison with similar information on Nigerian commercial banks which have unlimited branching status (so to speak).

6.2 Trends in Selected Financial Ratios for Nigerian Commercial Banks

From Table 6.1 we have for 1985 the minimum and maximum values for each of the computed ratios as well as the mean and standard deviation over all the sample banks. As previously highlighted the profitability ratios range from the return on assets as defined by net income before taxes divided by total assets (NITA) to the ratio of operating income to number of rural branches (OIRB).

The minimum return on assets was -7.53% while the maximum was 9.09% with the mean over all sample banks being 1.96%. The return on capital (NITC) was as low as -113.5% and as high as 251.5% among the sample banks. Relative to the capital base which essentially was thin in this period the returns were very high for some banks and low for others, presumably the weak or vulnerable ones. The net income per staff (NISS) was as low as -N0.021 million and as high as N0.105 million

Table 6.1: Summary Statistics of Financial Ratios for 1985

Number of Obs.	Variable	Minimum	Maximum	Mean	Standard Deviation
20	NITA	-7.52	9.09	1.96	0.036
	NITC	-113.58	251.45	61.20	0.870
	OITA	3.97	12.45	8.52	0.019
	OITC	34.55	812.32	263.07	1.974
	NISS*	-0.021	0.105	2.13	0.031
	OISS*	0.011	0.171	0.061	0.048
	OINB*	0.536	12.113	2.699	3.011
	OIRB*	1.023	18.628	6.522	5.952
	TLD	21.78	118.19	56.69	0.233
	CSTA	2.87	95.18	35.99	0.285
	GSTA	0.00	51.31	18.33	0.180
	TCTA	0.99	17.93	4.86	0.036
	TLSF	104.87	6056.72	1329.20	12.959
	TCRA	1.25	95.18	11.07	0.212
	TLCLL	101.98	1506.75	582.75	3.245
	TLTA	15.59	86.88	43.57	0.189
	LLTL	0.00	26.27	8.84	0.084
	RATA	18.80	93.46	68.25	0.199
	CATA	0.02	100.00	53.19	0.357
	LLOE	0.00	268.59	66.86	0.766
	OEOI	27.00	288.36	85.38	0.584
	OETA	2.35	11.52	6.56	0.025
	OETC	46.73	813.68	201.87	1.847
	OERA	3.53	46.89	11.58	0.098
20	OESS*	0.016	0.092	0.039	0.026
	OENB*	0.506	5.078	1.661	1.359
	OERB*	0.955	11.949	4.375	3.965
	DVOI	0.00	8.24	1.52	0.024
	TDCD	26.97	242.97	118.52	0.669
	TDTTD	14.50	88.64	38.13	0.186
	CSCD	9.49	349.37	143.07	1.101
	CSCSD	3.59	250.51	1.06	0.902
	TLCD	39.20	333.41	1.76	0.854
	RBUB	-	-	-	-
	LIOI	24.71	69.83	44.31	16.324
	TTDNB*	4.725	155.380	25.799	35.324
	TTDSS*	0.170	2.188	0.562	0.524

Note: Asterisked Ratios are measured in Million Naira.

with a mean of N0.021 million. The mean operating income per staff was N0.061 million while the same per branch was N2.639 million.

The liquidity ratios follow; namely, the ratio of loans to deposits (TLD), the ratio of cash and short-term funds to total assets (CSTA) and the ratio of government securities holding to total assets (GSTA). TLD was as low as 21.78% and as high as 118.1%. This means that the exposure of the banks exceeded their deposit base by as high as 18% in the most extreme case. On the average however, the ratio was 56.69%. As measured by CSTA, the average liquidity of the sample banks is 36% while as measured by GSTA the average was 18%. By implication cash and short-term funds averaged 36% for the sample banks while government securities averaged 18% of total assets respectively.

The capital adequacy ratios follow, defined by the ratio of total capital to total assets (TCTA), ratio of total loans to equity capital (TLSF), ratio of total capital to risk assets (TCRA), ratio of total loans to total capital plus loan loss provision (TLCLL). As for TCTA the average over the banks was 4.86% which was quite low. The maximum was 17.93% with the lowest being 0.99% which was dangerously low. Measured by the risk assets ratio, TCRA, the average was 11.07% while the minimum and maximum values were 1.25% and 95.2% respectively. The latter value was rather high but impressive still. Considering TLSF we find that the loan portfolio of the sample banks was on the average 13.29 times the shareholders' funds. Of the banks, the lowest was about 1.05 times the equity capital while the highest was 60 times the same. The latter is of course ridiculous but it shows the state of some of the Nigerian commercial banks prior to SAP. The authorised share capital as at 1985 was about N12 million which had not been fully subscribed by quite a number of the banks. In recent times the share capital was initially increased to N20 million and was revised upward again to N50 million for commercial banks. This was in recognition of the state of the industry as a whole as exemplified by the ratio, among others.

The TLCLL ratio is viewed a better ratio than the TLSF ratio (Sinkey and Walker, 1977). It is infact used by the Comptroller of the Currency as a *first test* of capital adequacy. It was also found in Sinkey and Walker (1977) to perform the best

in distinguishing between financially sound and vulnerable banks. This ratio averaged 5.83 for commercial banks in 1985. While the minimum was 1.02, the maximum was 15.06. These values reveal further the inadequacy of the capital and other provisions of Nigerian banks.

The ratio of loans to assets (TLTA), loan loss provision to total loans (LLTL), risk assets to total assets (RATA), current assets to total assets (CATA) and loan loss provision to operating expenses (LLOE) are used for assessing the risk or asset quality of commercial banks, among other existing ratios. The LLOE was used in Sinkey (1975) to assess loan quality.

TLTA averaged 43.57% while LLTL averaged 8.84%. RATA, CATA and LLOE averaged 68.2%, 53.2% and 66.86% respectively. The fairly low value of the LLTL should not be accepted on its face value. It is common knowledge that at this time many Nigerian banks had under-provided for bad and doubtful debts. Loans also have accounted for less than half of the total assets of the banks though more than half of the assets, almost 70%, is risky. The ratio of loan loss provision being 66.86% of operating expenses is still high and it would have been higher had the banks made realistic provision for Loan Losses.

Managerial efficiency is measured by the ratio of operating expenses to operating income (OEOI), which is perhaps the most popular in this class. The ratio of operating expenses to total assets (OETA), operating expenses to risk assets (OERA) and dividend to operating income (DVOI) are among other notable ones. OEOI averaged 85.38%, OETA averaged 6.56%, OERA averaged 11.58% while DVOI averaged 1.52%. The managerial efficiency indicators are not impressive in particular with operating expenses being 85% of operating income. That is, of every naira earned 85 kobo is spent. The margin for the banks is relatively low. This is confirmed by the NITA which averaged 1.96% for the same period. Also, dividend has been a maximum of 8.24% of operating income. Needless to note that, with proper control of operating expenses the profit margin could be enhanced considerably.

With respect to the ability of the banks to match properly its liabilities and

also to ensure a good cost structure we examine the ratio of time deposits to current deposits (TDCD), time deposits to total deposits (TDTTD), and total loans to current deposits (TLCD). The average of TDCD is 118.5%, for 1985. This implies that for every ₦1 of *free fund* the banks had ₦1.18 of high cost funds. Such cost structure is of course not ideal. The banks would be better off with a higher proportion of free funds. In this regard, the highest ratio was 242% while the lowest was 26.97%.

Time deposits averaged 38% of total bank deposits being as high as 88.6% in some banks. The average of TLCD was 1.75%. This implies that the current deposits of the banks were eroded largely to finance loans which has in most cases longer maturity profiles. The average deposit per branch was N25.80 million while per staff it averaged N0.562 million.

In 1986 as shown in table 6.2 the return of asset averaged 1.97% while the return on capital averaged 5.97%. The maximum return on asset (NITA) was 6.52%. OITA and OITC averaged 8.62% and 2.57% respectively. Also net income per staff (NISS) averaged ₦0.037 million while operating income per branch averaged ₦3.645 million. The profitability of Nigerian commercial banks still remained fairly low as reflected by the return on asset.

With respect to liquidity, total loans as a ratio of total deposits (TLD) averaged 62.22%, CSTA averaged 32.93% while GSTA averaged 11.17%. These figures represent lower degree of liquidity for the banks in 1986 compared with 1985.

The capital adequacy ratios TCTA, TLSF, TCRA, TLCLL averaged 5.19%, 13.68%, 8.7% and 629.7% respectively. Again, total loans exceeded the addition of shareholders' funds and loan loss provision. The capital ratios of 5.19% and 8.7% for TCTA and TCRA are still low and perhaps could be said to have been largely inadequate.

The ratios defined by TLTA, LLTL, RATA which measure risk and asset quality averaged 44.54%, 8.78% and 70.29% respectively. Others such as CATA and LLOE averaged 56% and 70.07%. We observe essentially an increase (about 2% points) in the RATA compared with 1986. The LLTL is low and indeed about the

Table 6.2: Summary Statistics of Financial Ratios for 1986

Number of Obs.	Variable	Minimum	Maximum	Mean	Standard Deviation
20	NITA	-8.41	6.51	1.97	0.035
	NITC	-102.83	216.93	59.76	0.808
	OITA	3.65	10.82	8.61	0.015
	OITC	24.22	932.28	257.24	1.861
	NISS*	-0.041	0.419	0.04	0.094
	OISS*	0.011	0.538	0.087	0.115
	OINB*	0.487	27.110	3.645	5.840
	OIRB*	0.929	17.580	6.591	5.479
	TLD	28.57	119.94	62.22	0.233
	CSTA	5.72	98.04	32.93	0.264
	GSTA	0.00	47.52	11.18	0.142
	TCTA	0.87	19.21	5.19	0.044
	TLSF	188.60	6987.12	1368.23	14.622
	TCRA	1.06	53.02	8.71	10.956
	TLCLL	176.89	1591.03	629.79	3.714
	TLTA	17.15	86.10	44.54	0.181
	LLTL	0.72	39.03	8.877	0.100
	RATA	31.71	96.26	70.29	0.204
	CATA	5.52	90.30	56.00	0.347
	LLOE	3.00	314.11	70.08	0.898
	OEOI	22.19	330.33	84.65	0.649
	OETA	1.85	12.05	6.65	0.029
	OETC	54.04	932.28	197.48	2.025
	OERA	3.57	28.65	9.90	0.054
20	OESS*	0.015	0.156	0.049	0.040
	OENB*	0.557	6.030	1.961	1.743
	OERB*	1.035	12.130	4.116	3.395
	DVOI	0.00	27.60	2.79	0.061
	TDCD	51.64	378.54	133.96	0.842
	TDTTD	20.51	73.32	35.28	0.125
	CSCD	16.59	687.97	175.18	1.821
	CSCSD	16.21	671.65	135.86	1.739
	TLCD	52.45	578.87	233.03	1.217
	RBUB	0	116.67	54.72	0.39
	LIOI	32.44	91.41	59.76	0.179
	YTONB*	5.368	194.685	28.407	41.723
	TTDSS*	0.171	3.855	0.682	0.833

Note: Asterisked Ratios are measured in Million Naira.

same with 1985. Loans as a proportion of total assets also increased though it is still less than half of the asset portfolio.

The ratio OEIOI, OETA, OERA and DVOI were on the average, 84.65%, 6.65%, 9.09% and 2.79% respectively. Managerial performance or efficiency was low also in 1986 with the same ratios not being significantly different from those in 1985. The proportion of operating income paid as dividend however improved, being 2.79% compared with 1.52% in 1985.

The trend in the matching of banks' liabilities still remained the same in 1986. TDCD averaged 133.95%, TDTTD averaged 35.28% while TLCD averaged 233%. A significant increase was recorded for TLCD when compared with the value of 175.80% in 1985. The deposit per branch and deposit per staff were ₦28.41 million and ₦0.682 million respectively. Also, with respect to revenue sources, loan income accounted on the average for 59.76% of total operating income. The minimum was 32.4%, while the maximum was 91.4%.

Table 6.3 renders similar information for 1987. By this time the SAP had been in force. More banks had been licensed, interest rates deregulated and foreign exchange also deregulated. The liquidity mop-up exercise had also begun with compulsory issuance of stabilization securities.

Return on assets averaged 2.64% though it was as low as -6.38% and as high as 12.72%. Return on capital was also 83.59% on the average with a minimum of -163.76% and a maximum of 299%. OITA and OITC averaged 10.07% and 449.39% respectively. The net income per staff and operating income per branch averaged ₦0.132 million and ₦4.829 million respectively. These figures reveal a better performance for the sample banks in general in 1987 than in both 1985 and 1986. In particular the return on assets at 2.64% is about 1 percentage point better than the average of 1.96% recorded for 1985 and 1986.

The liquidity ratios are indicated by TLD, CSTA and GSTA. The loan deposit ratio (TLD) averaged 55.7%, the cash and short-term funds to total assets ratio (CSTA) averaged 48.1% while the average was 9.66% for government securities as a ratio of total assets. One had expected the banks to be less liquid during this

Table 6.3: Summary Statistics of Financial Ratios for 1987

Number of Obs.	Variable	Minimum	Maximum	Mean	Standard Deviation
20	NITA	-6.38	12.72	2.64	0.038
	NITC	-163.76	299.14	83.59	1.016
	OITA	6.88	15.25	10.07	0.017
	OITC	77.02	1586.79	449.39	4.250
	NISS*	-0.052	0.908	0.065	0.200
	OISS*	0.028	1.089	0.132	0.232
	OINB*	0.792	38.400	4.829	8.255
	OIRB*	1.548	28.050	8.969	7.547
	TLD	15.78	90.54	55.79	0.197
	CSTA	4.79	87.64	48.14	0.431
	GSTA	0.00	42.24	9.66	0.114
	TCTA	0.78	10.52	3.94	0.027
	TLSF	253.31	7977.04	1946.34	22.797
	TCRA	0.96	14.40	6.32	0.041
	TLCLL	205.54	2884.69	698.96	6.574
	TLTA	10.94	63.92	39.68	0.163
	LLTL	5.61	39.82	9.91	0.113
	RATA	31.71	98.33	65.82	0.186
	CATA	4.79	92.05	53.04	0.323
	LLOE	38.26	292.64	64.28	0.833
	OEOI	16.61	160.52	74.94	0.315
	OETA	2.53	16.92	7.42	0.034
	OETC	51.48	1394.97	365.80	4.128
	OERA	4.88	53.37	13.07	0.113
20	OESS*	0.024	0.181	0.066	0.053
	OENB*	0.669	6.889	2.481	2.106
	OERB*	1.306	22.550	6.423	5.814
	DVOI	0.00	6.78	1.48	0.023
	TDCD	42.54	801.51	175.75	1.654
	TDTT	19.42	86.54	47.44	0.466
	CSCD	13.56	559.68	220.17	1.629
	CSCSD	13.56	471.19	154.57	1.295
	TLCD	49.30	401.77	204.01	0.902
	RBUB	0	110.00	54.60	0.381
	LIOI	34.16	95.92	61.81	0.168
	TTDNB*	6.202	174.580	29.826	38.653
	TTDSS*	0.199	4.953	0.807	1.069

Note: Asterisked ratios are measured in Million Naira.

period. The figures for TLD and GSTA confirm this while an increase was observed in the ratio of cash and short-term funds to total assets. This development has been confirmed also by Sobodu and Sotonwa (1991) as one due to the deregulation of foreign exchange. The banks had to increase their holding of short-term assets to facilitate foreign exchange trading and also as a cushion against harsh liquidity conditions.

We recall that TCTA, TLSF, TCRA and TLCLL are capital adequacy ratios. These averaged respectively 3.93%, 1946.3%, 6.3% and 698.95% in 1987. Quite obviously they indicate a decline compared with 1985 and 1986. The total loans to equity capital is frightening. Infact the same applies to the other ratios. Total loans as shown by the value of TLCLL is 7 times equity capital plus loan loss provision. The observed trend is that the state of bank capital had been on the decline progressively.

With respect to risk element and the quality of bank assets TLTA and LLTL averaged 39.68% and 9.91% respectively. The maximum value of LLTL was 39.8%. RATA and CATA averaged 65.8% and 53% respectively. This, in particular, follows the previous trends, though a slight decline is observed in RATA which is, of course, consistent with the increase in CSTA. Loan loss provision as a proportion of operating expenses (LLOE) averaged 64.28%. This represented a lower value compared with 1985 and 1986 though still high in absolute terms. The loan loss provision as a proportion of total loans (LLTL) being 9.91% represents an increase over similar figures for the previous periods.

The managerial efficiency ratios, OEIOI, OETA, OERA and DVOI averaged 74.95%, 7.43%, 13.07% and 1.48% respectively. The value of OEIOI indicates that for every ₦1 earned by the banks, on the average 75 kobo goes as operating expenses. This marks an improvement in the efficiency of management. A decline was however experienced with respect to the dividend/operating income ratio from 2.79% in 1986 to 1.48% in 1987. Also, operating expenses increased as a proportion of both total assets and risk assets. This implies that the rate of growth of operating expenses was higher than that of total and risk assets respectively.

Average operating expenses per staff was ₦0.066 million compared with ₦0.049 million in 1986 and ₦0.039 million in 1985. The operating expenses per branch was ₦2.481 million in 1987.

The average of TDCD, TDTTD and TLCD were 117.75%, 47.49% and 204.01%. TDCD shows that for every ₦1 of free funds, the banks had on the average ₦1.75 of time deposits. The TDTTD also shows that time deposits accounted for about 47% of total deposits on the average. The ratio of total loans to current deposits is also significant and it increased compared with similar values in both 1985 and 1986.

Although the ratio of loans to assets decreased, the proportion of loan income to total operating income increased to average 61.8% in 1987. This can be accounted for by the significant jump in interest rates during the period as a result of interest rate deregulation.

Total deposit per branch averaged ₦29.825 million while deposit per staff averaged ₦0.807 million. The ratio of rural branches to urban branches averaged 54.6% with the rural branches of some banks being about 1.10 times the number of urban branches.

The ratios as computed for 1988 and 1989 are presented in tables 6.4 and 6.5 respectively. The return on assets averaged 3.74% for 1988 while return on capital averaged 80.39%. NISS and OINB averaged ₦0.055 million and ₦4.953 million respectively. A further improvement was observed for the banks in 1988 at least in respect of profitability. NITA was highest in 1988 compared with 1985 to 1987.

The liquidity-ratios TLD, CSTA and GSTA averaged 48.9%, 42.6% and 10.6%. The proportion of deposits that is lent (TLD) further declined from 55.7% in 1987. The degree of liquidity measured by CSTA and GSTA is about the same with that of 1989.

Regarding capital adequacy, TCTA, TLSF, TCRA and TLCLL averaged 5.14%, 1337.47%, 10.37% and 481.51% respectively. These ratios still show significant inadequacy of bank capital among Nigerian commercial banks. Compared with the previous periods, an improvement was observed in all the indicators. As a proportion

Table 6.4: Summary Statistics of Financial Ratios for 1988

Number of Obs.	Variable	Minimum	Maximum	Mean	Standard Deviation
20	NITA	0.02	11.11	3.74	0.033
	NITC	0.50	237.31	80.39	0.759
	OITA	0.89	30.39	12.19	0.055
	OITC	102.93	1688.89	341.89	3.424
	NISS*	0.066	0.444	0.055	0.096
	OISS*	0.043	1.072	0.156	0.225
	OINB*	1.211	29.089	4.953	6.154
	OIRB*	2.312	101.810	15.379	22.133
	TLD	14.85	88.26	48.95	0.208
	CSTA	2.09	91.24	42.64	0.463
	GSTA	0.00	51.55	10.63	0.157
	TCTA	0.58	14.09	5.13	0.034
	TLSF	136.35	8997.28	1337.48	19.931
	TCRA	0.72	41.01	10.37	0.105
	TLCLL	88.19	1298.73	481.52	3.222
	TLTA	2.58	61.11	37.02	0.183
	LLTL	3.99	63.81	13.25	0.166
	RATA	7.16	90.31	61.10	0.215
	CATA	9.03	78.36	56.38	0.301
	LLOE	4.38	332.25	67.37	0.889
	OEOI	31.53	100.52	71.24	0.223
	OETA	0.78	23.50	8.44	0.046
	OETC	71.16	1688.89	261.49	3.592
	OERA	6.69	61.46	15.77	0.133
20	OESS*	0.029	0.628	0.101	0.133
	OENB*	0.768	17.034	3.265	3.694
	OERB*	1.742	59.620	9.939	13.039
	DVOI	0.00	17.18	2.17	0.041
	TDCD	36.92	549.92	143.06	1.041
	TDTTD	20.37	65.90	38.80	0.113
	CSCD	16.39	1021.89	198.77	2.169
	CSCSD	19.26	284.40	116.46	0.837
	TLCD	44.99	423.77	172.80	1.007
	RBUB	0	110.00	62.10	0.302
	LIOI	30.22	88.49	60.74	0.173
	TTDNB*	10.076	107.601	27.687	22.979
	TTDSS*	0.313	3.964	0.849	0.829

Note: Asterisk ratios are measured in Million Naira.

Table 6.5: Summary Statistics of Financial Ratios for 1989

Number of Obs.	Variable	Minimum	Maximum	Mean	Standard Deviation
20	NITA	-16.24	17.62	4.54	0.065
	NITC	-29.54	1021.94	133.79	2.192
	OITA	8.90	51.47	17.15	0.092
	OITC	268.57	1123.30	767.24	24.686
	NISS*	-0.073	0.699	0.066	0.153
	OISS*	0.056	1.014	0.169	0.208
	OINB*	1.737	20.695	4.539	4.075
	OIRB*	3.890	68.983	12.307	14.268
	TLD	16.21	166.24	55.56	0.336
	CSTA	3.66	94.81	41.08	0.266
	GSTA	0.00	43.41	7.66	0.124
	TCTA	1.21	17.56	5.50	0.069
	TLSF	138.25	46330.25	2816.30	102.584
	TCRA	18.69	125.29	17.52	0.295
	TLCLL	113.43	823.59	389.93	2.183
	TLTA	17.22	93.37	39.32	0.189
	LLTL	0.34	61.91	16.96	0.163
	RATA	3.64	97.97	58.20	0.215
	CATA	28.63	85.24	62.74	0.262
	LLOE	0.63	373.15	63.01	0.812
	OEOI	31.03	194.84	74.16	0.339
	OETA	6.02	44.76	12.61	0.096
	OETC	43.90	1021.84	633.45	22.583
	OERA	10.04	146.06	34.97	0.560
20	OESS*	0.039	0.314	0.103	0.071
	OENB*	1.106	6.421	2.925	1.579
	OERB*	2.360	21.403	7.655	5.258
	DVOI	0.00	21.74	3.00	0.052
	TDCD	8.82	416.22	95.37	0.834
	TDTTD	4.77	78.91	28.26	0.161
	CSCD	9.97	768.30	197.20	1.800
	CSCSD	9.97	609.50	121.98	1.317
	TLCD	54.34	527.32	171.54	1.030
	RBUB	20.69	230.00	87.37	0.489
	LIQI	21.49	91.76	54.73	0.192
	TTDNB*	7.321	45.329	19.479	10.301
	TTDSS*	0.224	1.802	0.664	0.383

Note: Asterisk ratios are measured in Million Naira.

of total and risk assets, total capital has shown an increase. TLSF and TLCLL have both declined due essentially to the de-emphasis of lending in the structure of assets emerging as a result of deregulation.

For the risk and asset quality measures, TLTA, LLTL, RATA, CATA and LLOE averaged 37.0%, 13.25%, 61.1%, 56.38% and 67.36% respectively. The de-emphasis in lending is more obvious from the 37.0% value of TLTA. The loans-to-assets ratio was 39.67% in 1987. The proportion of total loans provided for increased also to 13.25%. This had been less than 10% prior to 1988. This is not really a result of a substantial increase in loan loss provision but more a result of the relative decline in loan portfolio. The proportion of risk assets decreased while current assets increased slightly. The LLOE has been about the same with that of the different periods.

Managerial efficiency further improved in 1988 with OEOI averaging 71.24%. The average for OETA, OERA and DVOI were 8.44%, 15.77% and 2.17%. DVOI increased again in 1988 compared with 1987. Again operating expenses increased by more than the increase in risk assets and total assets. Operating expenses per staff was N0.101 million on the average while operating expenses per branch was N3.265 million.

TDCD, TDTTD and TLCD in 1988 averaged respectively 143.07%, 38.8% and 172.80%. The ratio of time deposits to current deposits still exceeded 100% implying from the figure that for every ₦1 of current deposit the banks had on the average ₦1.43 of time deposit. This represents a reduction, however, compared with 1987. A reduction was also experienced in the proportion of time deposits in total deposits. At this period deposit rates had continued to grow and it was becoming imperative for banks to dilute their deposit base. Deposit per branch averaged ₦27.687 million, while deposit per staff averaged ₦0.849 million.

The proportion of rural to urban bank branches averaged 62.1% compared with 54.6% in 1987 while loan income averaged 60.74% as a proportion of total operating income. The proportion was 61.80% in 1987.

Notable developments in 1989 include the 4.54% return on assets and 133.79%

as return on capital. The industry had been even more profitable by 1989 given these figures. The liquidity level remained about the same with that for 1988 given the fact that TLD, CSTA and GSTA averaged 55.56%, 41.07% and 7.67% respectively. The capital adequacy ratio again worsened in 1989 as can be observed from the average values of TCTA, TLSF, TCRA and TLCLL being 5.50%, 2816.3%, 17.5% and 389.9% respectively. Only TLCLL showed an improvement which, relative to the average values recorded for the previous periods, is very significant.

The risk and asset quality of the banks can be assessed by an examination of the average values of TLTA, LLTL, RATA, CATA and LLOE as done in the previous periods. The average values are given as 39.31%, 16.96%, 58.2%, 62.7% and 63.0%. The loan loss provision as a proportion of total loans (LLTL) increased significantly with the maximum value of 93.37%. The risk assets as a proportion of total assets declined from 61.1% in 1988 to 58.2% while the current assets to total assets ratio improved from 56.4% to 62.7% over the same period. Loan loss provision as a proportion of operating expenses declined from an average of 67.37% to 63.0% still over the period 1988 to 1989.

With respect to managerial efficiency, OEOI averaged 74.16%, OETA averaged 12.6% and OERA averaged 34.9%. The average for DVOI for 1989 is 3.00%. The OEOI average is still relatively high in addition to the fact that it worsened in 1989. The same is the case for OETA and OERA. The 34.97% average figure for OERA in particular represents a relatively high figure compared with about 15% in 1988 and less than 10% between 1986 and 1987. This is perhaps a result of the significant decline in the level of risk assets. Recall that RATA declined considerably in 1989.

The OENB remained about the same with the 1988 value with a value of ₦0.103 million while a decline in OESS was observed from ₦3.265 million in 1988 to ₦2.925 million.

The TDCD ratio averaged 95.37% in 1989. That is, for every ₦1 of current deposits, banks had on the average 97 kobo of time deposits. This reveals a major change in the structure of banks' deposit liabilities. Efforts can be said to have been

made to reduce the cost of funds utilized by the average Nigerian bank. We have seen also that on the average time deposits comprise 28.26% of total deposits.

Total deposits per branch has averaged ₦0.664 million. Also, loan income has reduced considerably to 54.73% from 60.74% in 1988. Also, the rural to urban branch ratio increased substantially to 87.37% compared with 62.10% in 1988. Some banks have 2.3 times more rural branches than urban branches.

Table 6.6 displays comparative figures for the study horizon 1985 to 1989. This also provides information on the various ratios for comparison between the pre-SAP and SAP periods. The table reveals that the profitability of banks had been on the increase between 1985 and 1989. The average return on assets over the period 1985 and 1986, pre-SAP, is 1.96%. The minimum return on assets over the SAP period is 2.64% recorded in 1987 while the maximum return is 4.54% recorded in 1989. Bank profitability has been higher over the SAP period than over the pre-SAP period. In this view we also find the average operating income per staff to be higher for the SAP than the pre-SAP period. In fact, the jump in OISS between 1986 and 1987 when SAP was adopted has been the most significant over the period. The same trend is observed for the operating income per branch.

Amongst the liquidity ratios one could observe a significant trend. The degree of liquidity as measured by the CSTA has improved between the pre-SAP and SAP period. The ratio was less than 36% in 1985 and 1987, jumped to 48.14% in 1988 and has decreased consistently to 41.07% in 1989. This reveals at least a 5% percentage point jump in CSTA and a higher level of liquidity. The holdings of government securities has however declined in the SAP period compared with the pre-SAP period. The decline however can be noticed from the year 1985. The slight reduction that can be observed between the pre-SAP and SAP periods, on the average values of loans to deposit ratio (TLD) is in line with the above trend. Quite clearly, this trend can be accounted for by the desire of banks to participate effectively at the foreign exchange market in which they (the banks) were the only authorised dealers. They needed to be more liquid to achieve this. This is inspite of the liquidity mop-up exercise which the CBN embarked upon from time to time.

A close look at the capital adequacy ratios reveals essentially that the banks and perhaps the Nigerian banking industry is under-capitalised. The total loan to equity capital ratio is over 1000 percent. Averagely, this has grown worse in the SAP period. The ratio has been high also for TLCLL. This is the ratio of total loans to all provisions or resources available as *backup*. This ratio was initially worsened between 1985 and 1987 then grew from 582.75% to 698.96% before it declined consistently to 389.92%. In this regard the SAP period has been better than the pre-SAP period. We earlier mentioned the steps currently taken by the CBN to correct this position. The 1989 report of the Nigeria Deposit Insurance Corporation (NDIC) had also revealed this development. In fact it showed that in reality quite a number of the banks have negative shareholders' funds particularly if more realistic provisions are made for loan losses.

The loan to asset ratio averaged 44% for the sample banks over 1985 and 1986, while it declined slightly to about 38% since the adoption of SAP. The 6 percentage point decline shows a trend towards reducing emphasis on lending for other assets, which perhaps are more liquid in nature. Provision for loan losses as a ratio of total loans has been on the increase and, infact, had doubled by 1989. Quite obviously the provision for loan losses as a proportion of total loans has been higher over the SAP period compared with the pre-SAP period. This is expected to increase further in the light of the implementation of the new Prudential Guidelines.

Apart from an increase in the risk asset to total asset ratio observed in 1986, there has been a consistent decline in the ratio since 1985. From 70.29% the ratio of risk assets to total assets has declined to 58.20%, being infact the lowest over the study period. It seems that the SAP period has been characterised by a deliberate attempt to reduce this ratio. Also, the increase in CSTA is consistent with this trend.

The table provides enough evidence to hold that managerial performance or efficiency has improved significantly over the SAP period compared with the pre-SAP period. The OEOI ratio averaged 84.8% between 1985 and 1986 and this has declined to about 72.4% since the adoption of SAP. Compared with 1988, however, the efficiency in 1989 worsened. As a ratio of total and risk assets respectively

Table 6.6: Means of Selected Financial Ratios for All Respondent Banks

S. No.	Ratio	1985	1986	1987	1988	1989	Average Pre SAP	Average SAP
1	NITA	1.96	1.97	2.64	3.75	4.54	1.97	3.63
2	OISS*	0.61	0.09	0.13	0.16	0.17	0.35	0.15
3	OINB*	2.7	3.65	4.83	4.95	4.54	3.17	4.77
4	TLD	56.69	62.22	55.79	48.94	55.55	59.46	53.43
5	CSTA	35.99	32.93	48.14	42.64	41.07	34.46	43.95
6	GSTA	18.33	11.18	9.66	10.63	7.66	14.76	9.32
7	TCTA	4.68	5.19	3.94	5.14	5.5	4.94	4.86
8	TLSF	1329.21	1368.24	1946.34	1337.47	2816.3	1348.73	2033.37
9	TCRA	11.08	8.71	6.32	10.37	17.57	9.9	11.42
10	TLCLL	582.75	629.79	698.96	481.51	389.92	606.27	523.46
11	TLTA	43.57	44.55	39.68	37.02	39.32	44.06	38.67
12	LLTL	8.84	8.78	9.91	13.25	16.96	8.81	13.37
13	RATA	68.25	70.29	65.82	61.1	58.2	69.27	61.71
14	CATA	53.2	56	53.05	56.38	62.74	54.6	57.39
15	LLOE	66.86	70.08	64.28	67.37	63.01	68.47	64.89
16	OEOI	85.38	84.65	74.95	71.24	74.16	85.02	73.45
17	OETA	6.56	6.65	7.43	8.44	12.61	6.61	9.49
18	OERA	11.58	9.9	13.07	15.77	34.97	10.74	21.27
19	OESS*	0.04	0.05	0.07	0.1	0.1	0.04	0.09
20	OENB*	1.66	1.96	2.48	3.27	2.93	1.81	2.89
21	DVOI	1.52	2.79	1.48	2.17	3	2.16	2.22
22	TDCD	118.52	133.96	175.75	143.07	95.37	126.24	138.06
23	TOTTD	38.13	35.28	47.44	38.8	28.26	36.71	38.17
24	TLCD	175.8	233.03	204.01	172.8	171.55	204.42	182.79
25	RBUB	-	54.7	54.6	62.1	87.37	27.35	68.02
26	LIOI	61.3	59.76	61.81	60.74	54.73	60.53	59.09
27	TTDNB*	25.79	28.4	29.82	27.69	19.48	27.1	25.66
28	TTDSS*	0.57	0.68	0.81	0.85	0.62	0.66	0.77

Note: All ratios are expressed in percentages except those asterisked (*) which are in Million Naira (N).

operating expenses has been on the increase. As a ratio of risk assets, it rose as high as 35% in 1989, being more than twice the 1988 value. Quite clearly the operating expenses per staff as well as per branch has been on the increase since 1985. The DVOI ratio fluctuated between 1985 and 1989. The highest value was however observed in 1989 to be 3.00%.

Regarding trends in matching deposit liabilities, the ratio of time to current deposits (free funds) increased consistently and significantly between 1985 and 1987. At this period, time deposits exceeded current deposits. Though this continued till 1988, a decline was observed since 1988, reducing to about 95% by 1989. Time deposits as a proportion of total deposits has been on a consistent decline since 1987. The ratio was 28.26% in 1989, representing the lowest since 1987.

Deposit per staff has increased consistently between 1985 and 1988 before declining significantly from ₦0.84 million per staff in 1988 to ₦0.664 million in 1989. The deposit per branch increased between 1985 and 1987, before it declined from ₦29.826 million to ₦19.479 million in 1989. Finally, loan income which averaged 60% pre-SAP has been on the decline over the SAP period. The proportion averaged 54.73% in 1989.

6.3 Bank Vulnerability and Resistance: Definitions and Univariate Analyses

One of the major objectives is to determine which factors and/or financial variables are major determinants of the financial condition, soundness or otherwise, of Nigerian commercial banks. To do this requires the definition of what is considered to be sound financial condition for a *resistant* bank and a weak financial condition that makes a bank *vulnerable*.

As was earlier mentioned, in the literature such classifications as problem/non-problem banks, failed/non-failed, financially successful/non-financially successful as well as potentially vulnerable/resistant banks exist. While it has been a lot easier classifying banks according to problem/non-problem and failed/non-failed, the other classifications have been highly subjective. In defining vulnerable and resistant banks we adopt a definition similar to that of Hunter and Srinivasan (1990). In this attempt

a bank was considered financially successful (or resistant) if the return on assets is at least 80 per cent of the median return on assets. As was observed in the study as well as in Korobow and Stuhr (1975) who first used the vulnerable/resistant classification, the separation between banks deemed resistant and those considered vulnerable can be expected to be imperfect.

In our case we adopted three different definitions as follows:

- (a) A resistant bank is one with the return on assets (NITA) being at least the median return on assets;
- (b) A resistant bank is one with the return on assets (NITA) being at least 80% of the median return on assets; and
- (c) A resistant bank is one with the return on assets (NITA) being at least 50% of the median return on assets.

Using each of these definitions, we define three classification variables namely BANK1, BANK2 and BANK3 associated with (a), (b) and (c) respectively. Notice that the classification gets increasingly less restrictive as one goes from (a) to (c).

Essentially, the definitions are expected to be good enough to clearly distinguish between the two groups of banks. That is, going by our return-on-assets based definition, we expect that the mean NITA for each of the class of vulnerable and resistant banks should be statistically significantly different. As a result a univariate analysis was carried out using the **PROC TTEST** procedure offered by the SAS software package version 6.04 for personal computers.

Table 6.7 presents the median return on assets for each of the periods 1985 to 1989 as well as the mean return on asset for the groups represented by the different classification variables. Due to the fact that we also aim to find out if there are any significant differences between the banks and bank performance in general in respect of ownership, head-office location and the existence or non-existence of technical partnership agreement we add the classification variables ROWN, HOL and TP.

ROWN defines the categories of predominantly publicly owned banks and predominantly privately owned banks while HOL defines the category of banks with

Table 6.7: Means and Median Return on Assets for Vulnerable and Resistant Banks
By Different Performance and Other Classifications

Var.	1985			1986			1987			1988			1989		
	All	Vul.	Res.	All	Vul.	Res.	All	Vul.	Res.	All	Vul.	Res.	All	Vul.	Res.
BANK1	1.96	-0.5	4.5	1.97	-0.6	4.56	2.64	0.2	9.7	3.75	1.1	6.3	4.54	0.5	8.6
BANK2	1.96	-1.1	3.9	1.97	-0.9	4.3	2.64	-0.1	4.5	3.75	0.6	5.4	4.54	-0.5	7.9
BANK3	1.96	-2.4	3.2	1.97	-1.5	3.8	2.64	-0.6	4.1	3.75	0.4	5.2	4.54	-1.5	7.1
ROMN	1.96	1.7	2.7	1.97	1.6	2.8	2.64	1.96	4.2	3.75	3.9	3.5	4.54	3.6	6.2
HOL	1.96	3.5	-0.5	1.97	2.9	0.6	2.64	4	0.6	3.75	4.1	3.2	4.54	4.5	4.6
TP	1.96	4.1	-0.7	1.97	3.7	-0.6	2.64	3.8	0.9	3.75	5.3	1.5	4.54	-	-
MEDIAN	1.7893			1.8316			2.0035			2.6863			4.5036		

Note: For Ownership (ROMN), Vul. and Res., represent public and private owned banks.
For Head-Office location (HOL), Vul. and Res., represent Lagos and Outside Lagos locations.
For Technical Partnership, Vul. and Res. represent banks with and without technical partnership agreements.

head office located in Lagos and those with head office outside Lagos. The classification variable TP defines the category of banks with technical partnership agreements and those without.

In 1985, going by the bank performance related classification variables, BANK1, BANK2 and BANK3, the average return on assets for the vulnerable banks was negative while the average return for resistant banks was 4.5% based on BANK1. This was 3.9% and 3.2% for BANK2 and BANK3 respectively. The return on assets for banks classified as resistant according to classification variable BANK1 exceeded 1.789% which is less than the average return on assets for all sample banks. We also observe the decline in return on assets for both vulnerable and resistant classification over the various classification variables, BANK1 to BANK3. This is bound to be the case, indeed for all periods, due to the fact that an attempt to classify more banks as resistant implies a lowering of the cut-off return on assets, as is also reflected by our definition for the classification variables.

While the overall rate of return on assets in 1987 had tended to give the impression of an insignificant change in bank performance in that year, compared with 1986, the average return on assets for the year tells a clearer story. We observe that significant improvements were recorded by resistant banks while some improvement, though marginal, was also observed for vulnerable banks. The return on assets of vulnerable banks were however still negative.

The observed improvement in bank profitability earlier in the SAP period compared with the pre-SAP period is further confirmed by the average return on assets of both vulnerable and resistant banks over the period 1987 to 1989. By 1988 average return on assets for all vulnerable banks going by BANK1, BANK2 and BANK3 were positive and as high as 1.1%. The same positive return was observed for vulnerable banks according to BANK1 in 1989. Also, by 1989, resistant banks showed relatively high return on assets. The ratio was 8.6%, 7.9% and 7.1% according to BANK1, BANK2 and BANK3 respectively. The median return on assets had also increased significantly to 4.50%.

The univariate T-test of differences of sample means was adopted to test the

hypothesis that the means of the different ratios earlier highlighted are equal for the different categories of banks based on the classification using BANK1, BANK2 and BANK3. The result of the test is displayed in table 6.8 to 6.10 for 1985. Each of these tables presents the number of observations (banks) in each category of vulnerable and resistant banks upon which the means are computed. The results of the test of difference in means are displayed for equal and unequal population variances. The result of the test of equality of sample variances indicated by **Prob > F'** determines which results are to be followed, for equal or unequal variances.

For 1985, the value of **Prob > F'** being in excess of 0.05 (5%) implies the equality of sample variances for NITA for vulnerable and resistant banks. The **Prob > ITI** value for equal sample variances is thus followed. This indicates that the average return on assets is significant statistically from Table 6.8. This development gives some credence to our basis for classification. Among the profitability ratios NITC, NISS, OISS and OINB were statistically significant at 5% level. The ratio OITA is statistically significant at 15% level.

Of the liquidity ratios only the GSTA ratio was significant at 5% significance level. We notice that the ratio is higher for the resistant banks than the vulnerable banks. It is expected that the resistant banks will be more liquid than vulnerable banks.

None of the capital adequacy ratios was significant, even at 15% level. One may not be surprised as both the vulnerable and resistant banks were shown to be highly under-capitalised. Hence, one can hardly rely on capital ratios for distinguishing bank performance categories. Interestingly the quality of assets or degree of risk is not a significant factor in determining bank performance among Nigerian banks as at 1985. No relevant ratio in this regard was observed to be significant even at 15%. This implies that there is no sufficient evidence to believe that the quality of asset or degree of risk taking differs between vulnerable and resistant banks as at 1985.

Managerial efficiency made a difference between vulnerable and resistant banks based on the BANK1 classification variable in 1985. This is due to the

Table 6.8: Results of Univariate T-Test for BANK1 in 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	9	9	-0.005	0.045	0.0031	0.0007	0.5611
NITC	9	9	-0.003	8.227	0.0028	0.0006	0.1755
OITA	9	9	0.078	0.092	0.1535	0.1344	0.9959
OITC	9	9	2.616	2.644	0.9778	0.9775	0.3753
NISS	9	9	-0.022	0.044	0.0017	0.0003	0.0069
NISS	9	9	0.03	0.091	0.0105	0.0043	0.0549
OINB	9	9	0.996	4.401	0.0211	0.0113	0
OIRB	6	8	2.12	9.828	0.0092	0.0095	0.0006
TLB	9	9	0.639	0.495	0.2193	0.2013	0.0174
CSTA	9	9	0.433	0.282	0.3055	0.2899	0.2929
GSTA	9	9	0.0118	0.249	0.1442	0.125	0.6621
TCTA	9	9	0.055	0.042	0.4864	0.4761	0.0018
TLSF	9	9	16.786	9.798	0.2814	0.265	0.0006
TCRA	9	9	0.159	0.063	0.364	0.0357	0
TLCLL	8	9	6.631	5.113	0.3865	0.3519	0.0434
TLTA	9	9	0.501	0.37	0.1648	0.1458	0.0001
LLTL	8	9	0.075	0.1	0.5605	0.5443	0.4466
RATA	9	9	0.633	0.732	0.324	0.3089	0.2202
CATA	9	9	0.601	0.483	0.4916	0.8006	0.0001
LLOE	8	9	0.521	0.8	0.4807	0.472	0.8248
OEOI	9	9	1.191	0.517	0.0186	0.0095	0.0019
OETA	9	9	0.084	0.047	0.0018	0.0003	0.8414
OETC	9	9	2.62	1.417	0.1928	0.1742	0.0802
OERA	9	9	0.116	0.065	0.0384	0.0249	0.0003
OESS	9	9	0.033	0.046	0.2898	0.2737	0.4294
OENB	9	9	1.083	2.24	0.087	0.0689	0.0023
OERB	9	8	2.353	5.892	0.078	0.9993	0.001
DVOI	9	9	0.002	0.028	0.0281	0.0165	0.0001
TDCD	9	9	0.776	1.594	0.012	0.0052	2237
TDTTD	9	9	0.344	0.419	0.4202	0.4087	0.3446
CSCD	9	9	1.278	1.584	0.3649	0.571	0.444
CSCSD	9	9	0.857	1.266	0.4414	0.3511	0.3824
TLCD	9	9	1.593	1.923	0.4637	0.4299	0.7414
RBUB	11	9	0.469	0.604	0.3378	0.4625	0.6129
LIOI	9	9	8.349	0.514	0.0747	0.3232	0.0001
TTDNB	9	9	10.154	41.444	0.556	0.0573	0
TTDSS	9	9	0.313	0.81	0.0089	0.0398	770.0114

Table 6.9: Results of Univariate T-Test for BANK2 in 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	7	11	-0.011	0.039	0.0089	0.0013	0.0001
NITC	7	11	-0.085	1.055	0.005	0.003	0.2682
OITA	7	11	0.077	0.091	0.1815	0.1437	0.6592
OITC	7	11	2.806	2.519	0.8024	0.7733	0.1308
NISS	7	11	-0.004	0.037	0.003	0.004	0.0192
OISS	7	11	0.034	0.779	0.0434	0.55	0.1091
OINB	7	11	1.103	3.714	0.0368	0.0713	0.0003
OIRB	5	9	2.335	8.852	0.0167	0.0441	0.0013
TLD	7	11	0.662	0.507	0.2879	0.1776	0.0031
CSTA	7	11	0.487	0.279	0.2114	0.136	0.1079
GSTA	7	11	0.139	0.2115	0.4304	0.4217	0.9335
TCTA	7	11	0.058	0.043	0.5115	0.3983	0.0001
TLSF	7	11	18.665	9.873	0.2905	0.1671	0
TCRA	7	11	0.186	0.063	0.3786	0.2444	0
TLCLL	7	10	6.546	5.325	0.533	0.463	0.237
TLTA	7	11	0.519	0.382	0.2287	0.1362	0.0232
LLTL	7	10	0.851	0.091	0.9046	0.8975	0.4339
RATA	7	11	0.624	0.72	0.4195	0.335	0.0583
CATA	7	11	0.584	0.505	0.7106	0.694	0.6447
LLOE	7	10	0.594	0.721	0.7519	0.749	0.9457
OEOI	7	11	1.292	0.575	0.0429	0.0066	9.0012
OETA	7	11	0.088	0.051	0.0023	0.0007	0.4217
OETC	7	11	2.910	1.463	0.2019	0.112	0.0198
OERA	7	11	0.183	0.073	0.0726	0.0162	0.0003
OESS	7	11	0.037	0.041	0.7538	0.7611	0.6132
OENB	7	11	1.245	1.926	0.2322	0.3135	0.0042
OERB	5	9	2.632	5.344	0.1275	0.2343	0.0002
DVOI	7	11	0.002	0.232	0.0445	0.0799	0.0017
TOCD	7	11	0.855	1.395	0.0799	0.0953	0.177
TOTTD	7	11	0.376	0.385	0.934	0.9261	0.2476
CSCD	7	11	1.44	1.424	0.9766	0.9771	0.6789
CSCSD	7	11	0.983	1.111	0.07721	0.7784	0.6337
TLCD	7	11	1.712	1.788	0.8699	0.8608	0.5462
RBUB	9	11	0.488	0.596	0.4277	0.4192	0.9001
LPII	7	11	10.594	0.51	0.3465	0.2107	0.0001
TTDNB	7	11	11.366	34.984	0.1034	0.1736	0
TTDSS	7	11	0.348	0.697	0.1294	0.1749	0.0448

Table 6.10: Results of Univariate T-Test for BANK3 in 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	4	14	0.024	0.032	0.0578	0.002	0.3212
NITC	4	14	-0.275	0.866	0.0373	0.0154	0.7267
OITA	4	14	0.069	0.089	0.1716	0.9475	0.3188
OITC	4	14	2.23	2.459	0.7045	0.5076	0.0102
NISS	4	14	-0.009	0.029	0.0097	0.0245	0.1282
OISS	4	14	0.023	0.071	0.0123	0.0809	0.033
OINB	4	14	0.848	3.228	0.0184	0.1699	0.001
OIRB	3	11	2.225	7.697	0.0319	0.1662	0.0562
TLD	4	14	0.733	0.52	0.3642	0.1084	0.0144
CSTA	4	14	0.552	0.305	0.3395	0.1325	0.0962
GSTA	4	14	0.046	0.222	0.0278	0.0528	0.1232
TCTA	4	14	0.0692	0.043	0.5288	0.1903	0
TLSF	4	14	24.512	10.086	0.3445	0.0457	0
TCRA	4	14	0.266	0.066	0.4471	0.0965	0
TLCLL	4	13	3.847	6.437	0.1526	0.1699	0.5956
TLTA	4	14	0.554	0.401	0.3703	0.1629	0.0124
LLTL	4	13	0.145	0.0709	0.2428	0.1218	0.4875
RATA	4	14	0.684	0.682	0.9924	0.9879	0.0488
CATA	4	14	0.58	0.531	0.8556	0.8105	0.2998
LLOE	4	13	1.015	0.562	0.3759	0.3168	0.7831
OEOI	4	14	1.565	0.651	0.1381	0.0024	0.0005
OETA	4	14	0.093	0.058	0.238	0.0101	0.5829
OETC	4	14	3.506	1.594	0.3405	0.0013	
OERA	4	14	0.2	0.092	0.3164	0.0482	0.0006
OESS	4	14	0.0325	0.042	0.452	0.559	0.3592
OENB	4	14	1.179	1.799	0.184	0.4371	0.0167
OERB	3	11	2.818	4.799	0.1689	0.4651	0.0019
DVOI	4	14	0	0.019	0.0179	0.1738	0
TDCD	4	14	0.685	1.328	0.0146	0.09	0.0367
TDTTD	4	14	0.305	0.403	0.2337	0.3703	0.2439
CSCD	4	14	1.554	1.395	0.8248	0.8082	0.7486
CSCSD	4	14	1.089	1.053	0.9472	0.9464	0.0001
TLCD	4	14	1.785	1.75	0.954	0.9453	0.5317
RBUB	6	14	0.444	0.567	0.5643	0.5405	0.7989
LIOI	4	14	17.866	0.593	0.39822	0.0592	0.0001
TTDNB	4	14	9.798	30.375	0.0717	0.3183	0.001
TTDSS	4	14	0.279	0.642	0.074	0.2315	0.0639

significance of OEOI, OETA and OERA as well as DVOI, among the efficiency ratios. The operating expenses per branch (OINB) was also observed to be statistically significant. We expect, as might be observed in the table, the ratio expressed by OEOI, OETA and OERA to be higher for vulnerable than for resistant banks. However, the ratio DVOI is in line with expectation also as it has a higher value, 2.8% for resistant banks.

Of the ratios bordering on match of liability the ratio of time to total deposits was found statistically significant at 5% level. The ratio is higher for resistant than for vulnerable banks. This implies that the resistant Nigerian banks in 1985 had a higher proportion of time deposits than vulnerable banks. This means that resistant banks are high cost banks. Also, the deposit per branch and deposit per staff is significantly different between vulnerable and resistant banks, with the resistant banks having a higher value than vulnerable banks.

For BANK2, among the profitability ratios NITA, NITC, NISS, OISS and OINB were significant at 5% with OITA being significant at 15% level. Only the ratio of cash and short-term funds to total assets (CSTA) was significant at 15% level. This ratio is higher for vulnerable than for resistant banks. None of the capital adequacy and risk ratios were observed to be significant. Among the ratios for assessing managerial performance only OEOI, OETA, OERA, OERB and DVOI were statistically significant at 5% level. For liability match, only the ratio TDCD was significant at 10% level. The deposit per branch and deposit per staff ratios were also statistically significant.

For the classification variable BANK3, of the significant variables found to distinguish bank performance going by BANK2 definition, all but the ratio OINB, CSTA and OERA were statistically significant. In addition the ratio GSTA was found significant.

The ratio NITA, NITC, OISS, OINB and OIRB were found statistically significant for distinguishing between the vulnerable and resistant banks going by the BANK1 classification in 1986. Tables 6.11 to 6.13 presents the results for 1986. The GSTA ratio was also found statistically significant among liquidity ratios, at 5%

level, the ratios TLSF and TLCLL were statistically significant at 10% level among the capital adequacy ratio, and TLTA, among the risk ratios was found statistically significant at 5% level. Among the managerial efficiency ratios, OEOI, OETA, OETC and OERA were significant statistically at 5% level; OERB and DVOI were significant at 10% and 15% level respectively. The significance of loan income to total income (LIOI) ratio at 5% indicates the significance of revenue sources as a significant group of factors for distinguishing between the different classes of banks. None of the ratios assessing the match of liability was found statistically significant for distinguishing these classes of banks at least according to the classification variable BANK1.

With respect to BANK2 classification, NISS was found significant statistically while OISS and OIRB were now statistically insignificant, among ratios that had earlier been found significant among profitability ratios for BANK1. In addition to GSTA, the ratio, CSTA, was found statistically significant with respect to BANK2, among liquidity ratios. The TLCLL capital ratio which was found significant at 10% level for BANK1 was dropped for BANK2 and TLSF was found significant at 15% level in contrast to 10% as was the case for BANK1. Also, the dividend related ratio for assessing managerial performance which was significant statistically at 15% level with respect to BANK1 was dropped for BANK2. The LIOI ratio still remained significant at 5% level for BANK2.

For BANK3, still in 1986, among the profitability ratios NITA, NITC, NISS and OISS were found significant at 5% level, the liquidity ratio GSTA was still found significant statistically for BANK3 classification of banks at 5% level, CSTA was dropped and the ratio of loans to deposits (TLD) was also found significant at 5% level. Only the loan-to-asset ratio (TLTA) among asset quality ratios, was found significant in relation to BANK3 at 5% level. The ratios OEOI, OETC, OERA, OERB and DVOI were found significant according to the BANK3 classification of banks. Both the ratio TDCD and TDTTD were found to be statistically significant at 5% and 15% levels respectively for distinguishing bank performance according to the classification variable, BANK3. None of the ratios in this class had been found

Table 6.11: Results of Univariate T-Test for BANK1 in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	10	10	-0.006	0.0456	0.0009	0.001	0.0467
NITC	10	10	0.02	1.175	0.0013	0.0002	0.4321
OITA	10	10	0.082	0.907	0.2301	0.2143	0.0424
OITC	10	10	2.932	20213	0.413	0.402	0.0003
NISS	10	10	-0.004	0.078	0.0646	0.0496	0
OISS	10	10	6.044	0.13	0.1128	0.0959	0.00094
OINB	10	10	1.435	5.856	0.1074	0.0907	0
OIRB	6	9	1.998	9.653	0.0023	0.0031	0.001
TLD	10	10	0.69	0.55	0.2201	0.2041	0.6941
CSTA	10	10	0.4	0.258	8.2541	0.2389	0.2635
GSTA	10	10	0.46	0.177	0.0473	0.0339	0.0087
TCTA	10	10	0.06	0.044	0.4607	0.451	0.0001
TLSF	10	10	18.973	8.392	0.1241	0.1071	0
TCRA	10	10	0.104	0.07	0.5197	0.5113	0
TLCLL	9	10	7.917	4.841	0.1001	0.0698	0.0089
TLTA	10	10	0.543	0.348	0.0203	0.0115	0.2557
LLTL	9	10	0.085	0.09	0.9172	0.9137	0.1707
RATA	10	10	0.736	0.67	0.4899	0.4808	0.6746
CATA	10	8	0.607	0.501	0.5417	0.5341	0.9476
LLOE	9	10	0.589	0.802	0.6265	0.6206	0.9547
OEOI	9	10	0.589	0.802	0.6265	0.6206	0.9547
OETA	10	10	0.088	0.045	0.001	0.0002	0.9559
OETC	10	10	2.912	1.038	0.0479	0.0344	0
OERA	10	10	0.13	0.068	0.0143	0.0072	0.0067
OESS	10	10	0.047	0.052	0.8189	0.8163	0.6269
OENB	10	10	1.62	2.302	0.4078	0.3967	0.5587
OERB	6	9	2.267	5.348	0.0533	0.0844	0.0024
DVOI	10	10	0.007	0.049	1461	0.1291	0
TDCD	10	9	1.185	1.512	0.4319	0.4137	0.4442
TDTT	10	9	0.325	0.384	0.3431	0.316	0.1427
CSCD	10	9	2.095	1.371	0.4017	0.4028	0.1512
TLCD	10	9	2.481	2.163	0.5848	0.3747	0.0001
RBUB	10	10	0.523	0.572	0.7907	0.7877	0.165
LIOI	10	9	0.677	0.509	0.0507	0.0374	0.7365
TTONB	10	10	14.646	42.168	1614	0.1445	0.0003
TTDSS	10	10	0.436	0.927	0.2106	0.1944	0.0077

Table 6.12: Results of Univariate T-Test for BANK2 in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	9	11	-0.009	0.043	0.0017	0.0001	0.0697
NITC	9	11	-0.019	1.102	0.0018	0.0005	0.46
OITA	9	11	0.082	0.0896	0.3542	0.3074	0.0293
OITC	11	11	3.069	2.166	0.3529	0.2923	0
NISS	9	11	-0.004	0.071	0.0611	0.0723	0
OISS	9	11	0.047	0.12	0.1439	0.0636	0.0012
OINB	9	11	1.507	5.395	0.1214	0.1427	0
OIRB	6	9	1.998	9.653	0.0023	0.0031	0.001
TLD	9	11	0.705	0.554	0.1823	0.1547	0.4953
CSTA	9	11	0.43	0.247	0.1594	0.1246	0.2032
GSTA	9	11	0.048	0.164	0.0637	0.0677	0.0187
TCTA	9	1	0.061	0.044	0.4708	604147	0
TLSF	9	11	20.131	8.406	0.1232	0.0731	0
TCRA	9	11	0.1090	0.069	0.4827	0.4253	0
TLCLL	8	11	7.923	5.116	0.174	0.1053	0.0076
TLTA	9	11	559	0.352	0.0182	0.0068	0.183
LLTL	8	11	0.094	0.083	0.8316	0.814	0.128
RATA	9	11	0.721	0.688	0.7255	0.7241	0.7862
CATA	9	9	0.568	0.552	0.9244	0.9232	0.9944
CATA	9	9	0.568	0.552	0.9255	0.9232	0.9944
LLOE	8	11	0.654	0.734	0.8576	0.8542	0.8793
OEOI	9	11	1.52	0.515	0.025	0.0074	0.0001
OETA	9	11	0.091	0.049	0.0007	0.0001	0.9686
OETC	9	11	30.088	1.064	0.0525	0.0213	0
OERA	9	11	0.136	0.069	0.016	0.0024	0.0035
OESS	9	11	0.051	0.048	0.891	0.8871	0.5492
OENB	9	11	1.732	2.148	0.6096	0.6089	0.678
OERB	6	9	2.267	5.348	0.1533	0.0844	0.0024
DVOI	9	11	0.008	0.045	0.1643	0.089	0.0002
TDCD	9	10	1.226	1.442	0.5945	0.5914	0.5974
TDITD	9	10	0.322	0.38	0.3289	0.3255	0.2635
CSCD	9	10	2.28	1.277	0.2714	0.2413	0.1027
CSCSD	9	10	1.745	1.011	0.4002	0.3733	0.0922
TLCD	9	10	2.613	2.075	0.3729	0.3505	0.3108
RBUB	9	11	0.581	0.52	0.7511	0.7379	0.2853
LIOI	9	10	0.7	0.505	0.0239	0.013	0.689
TTDNB	9	11	15.474	38.989	0.1937	0.2188	0.0011
TTOSS	9	11	0.465	0.859	0.2829	0.3058	0.0161

Table 6:13: Results of Univariate T-Test for BANK3 in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	7	13	-0.015	0.038	0.0009	0.0002	0
NITC	7	13	-0.162	1.007	0.0017	0.0005	0.4254
OITA	7	13	0.082	0.088	0.5339	0.4416	0.0607
OITC	7	13	3.059	2.31	0.5513	0.405	0
NISS	7	13	-0.009	0.062	0.0404	0.1061	0.0001
OISS	7	13	0.04	0.112	0.0981	0.1882	0.0032
OINB	7	13	1.47	40816	0.1218	0.2312	0.0005
OIRB	5	10	2.167	8.803	0.0052	0.0204	0.002
TLD	7	13	0.761	0.548	0.098	0.048	0.3236
CSTA	7	13	0.412	0.284	0.4062	0.312	0.1347
GSTA	7	13	0.026	0.156	0.0142	0.0437	0.0014
TCTA	7	13	0.071	0.416	0.3261	0.1633	0
TLSF	7	13	22.186	9.103	0.182	0.0535	0
TCRA	7	13	0.128	0.065	0.4007	0.2276	0
TLCLL	7	12	7.554	5.566	0.3815	0.2724	0.0237
TLTA	7	13	0.617	0.353	0.005	0.0004	5471
LLTC	7	12	0.107	0.0766	0.6091	0.5422	0.0957
RATA	7	13	0.753	0.676	0.463	0.4383	0.7862
CATA	7	11	0.566	0.556	0.9598	0.9572	0.5967
LLOE	7	12	0.744	0.675	0.8851	0.8794	0.7296
OEOI	7	13	1.367	0.566	0.0524	0.0048	0.0001
OETA	7	13	0.097	0.05	0.0003	0.0001	0.2132
OETC	10	13	3.221	1.304	0.15	0.0396	0
DERA	7	13	0.143	0.075	0.039	0.0044	0.0123
OESS	7	13	0.0492	0.0489	0.9774	0.9749	0.424
OENB	7	13	1.844	2.024	0.8369	0.8328	0.9137
OERB	7	10	2.513	4.917	0.094	0.2073	0.0018
DVOI	5	13	0.002	0.0418	0.0802	0.1807	0
TDCD	7	12	0.959	1.562	0.1049	0.1363	0.1543
TDTTD	7	12	0.284	0.392	0.0432	0.0646	0.0775
CSCD	7	12	1.718	1.772	0.9515	0.9528	0.716
CSCSD	7	12	1.176	1.165	0.7155	0.7375	0.3516
TLCD	7	12	2.705	2.111	0.4074	0.3184	0.0903
RBUB	7	13	0.58	0.529	0.8022	0.7907	0.6997
LIOI	7	12	0.691	0.543	0.0957	0.0815	0.8182
TTDNB	7	13	16.163	35	0.2406	0.3492	0.0112
TTDSS	7	13	0.438	0.813	0.2651	0.3503	0.0596

significant for BANK1 and BANK2. The revenue sources ratio was still statistically significant at 5% level for BANK3. Infact, we find that the ratio is higher for vulnerable banks than the resistant banks.

In summary in 1986, profitability, liquidity and managerial efficiency as well as the revenue sources ratios were found significant in distinguishing between the classes of banks according to BANK1, BANK2 and BANK3 respectively. In 1985, this characteristic was observed for profitability ratios, managerial efficiency ratios and liability match ratios.

In 1987, only three of the profitability ratios were found significant at 5% level for the classification variable BANK1. These include NITA, NITC and OITC as can be observed from Tables 6.14 to 6.16. All the liquidity ratios were found significant statistically at 5% and 10% levels. The CSTA and GSTA ratios were significant for BANK1 at 10% level. Of the capital ratios TLSF and TLCLL were found statistically significant at 5% and 10% levels respectively according to the BANK1 classification. This is similar to the case of BANK1 in 1986. Also, the risk ratio was found significant for distinguishing between bank performance according to BANK1. The specific ratio here is TLTA. Of the managerial efficiency ratios, OEOI, OETA, OETC and OERA were all significant at 5% level for BANK1. Liability match was also significant. Thus TD CD ratio was significant at 10% and TDTTD was significant at 15% and TTDSS was significant at 5% level.

For BANK2, of the profitability ratios found significant for BANK1, OISS was dropped and OITC was found significant at 5% level. Among the liquidity ratios, CSTA was dropped in distinguishing banks according to BANK2 classification, the same ratios were significant for the managerial efficiency category though OERA was found significant statistically at 15% level rather than at 5% level as was the case for BANK1. Both the ratios TD CD and TTDSS were dropped for BANK2, TDTTD was found statistically significant at 5% and then the ratio TLCD was found statistically significant at 15% level.

Going by the BANK3 classification only the variables NITA and NITC were found significant at 5% level among the profitability ratios, no liquidity ratio was

Table 6:14: Results of Univariate T-Test for BANK1 in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	10	10	0.002	0.097	0.069	0.0462	0
NITC	10	10	0.379	1.292	0.0552	0.041	0.7176
OITA	10	10	0.101	0.338	0.3403	0.3274	0
OITC	10	10	6.43	2.558	0.0516	0.0377	0
NISS	10	10	0	0.131	0.1659	0.149	0
OISS	10	10	0.057	0.206	0.1722	0.1554	0
OINB	10	10	2.221	7.438	0.1766	0.1631	0
AOIRB	9	7	7.15	110308	0.2854	0.2894	0.3737
TLD	10	10	0.674	0.442	0.0108	0.0049	0.905
GSTA	10	10	0.052	0.141	0.099	0.0824	0.0245
TCTA	10	10	0.032	0.354	0.3316	0.3184	0
TLSF	10	10	31.071	7.856	0.0288	0.0181	0
TCRA	10	10	0.054	0.098	0.2615	0.2464	0.0183
TLCLL	9	10	10.006	4.275	0.0854	0.0549	0.0001
TLTA	10	10	0.488	0.31	0.0368	0.0271	0
LLTL	9	10	0.103	0.096	0.9034	0.9001	0.3446
RATA	10	10	0.658	0.642	0.8767	0.8771	0.6465
CATA	9	10	0.608	0.485	8.5792	0.5782	0.4045
LLOE	9	101	0.529	0.745	0.5898	0.5861	0.656
OEOI	10	10	0.974	0.525	0.0014	0.0003	8262
OETA	10	10	0.099	0.048	0.0013	0.0004	2564
OETC	10	10	6.051	1.265	0.012	0.0057	0
OERA	10	10	0.165	0.075	0.0364	0.042	0
OESS	10	10	0.057	0.076	0.4598	0.45	0.6514
OENB	10	10	2.181	2.782	0.5462	0.5385	0.6246
OERB	9	7	6.603	6.192	0.8907	0.894	0.3752
DVOI	10	10	0.008	0.021	0.2308	0.215	0.5631
TDCD	9	10	1.11	2.34	0.1074	0.0171	0.0003
TDTTD	9	10	0.302	0.63	0.1259	0.1286	0
CSCD	9	10	2.5	1.933	0.4851	0.4648	0.2138
CSCSD	9	10	1.527	1.562	0.9567	0.9542	0.3019
TLCD	9	10	2.396	1.72	0.1191	0.0137	0.6943
RBU8	10	10	0.62	0.472	0.4121	0.401	0.3297
LIOI	10	10	0.643	0.593	0.5281	0.52	0.4011
TTDNB	10	10	16.959	42.693	0.1576	0.1406	0.0177
TTDSS	10	10	0.431	1.183	0.135	0.1179	0.004

Table 6.15: Results of Univariate T-Test for BANK2 in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	8	12	-0.001	0.045	0.0071	0.0036	0.5667
NITC	8	12	0.197	10262	0.0323	0.017	0.7844
OITA	8	12	0.099	0.102	0.2407	0.7788	0.0043
OITC	8	12	5.861	3.583	0.2812	0.2586	0.679
NISS	8	12	-0.002	0.11	0.1554	0.2315	0
OISS	8	12	0.061	0.179	0.197	0.2742	0.0001
OINB	8	12	2.35	6.482	0.2095	0.2846	0.0006
OIRB	7	9	4.53	12.422	0.0347	0.0324	0.0904
CSTA	8	12	0.577	0.417	0.04748	0.4307	0.2964
GSTA	8	12	0.049	0.128	0.1038	0.1277	0.0959
TCTA	8	12	0.032	0.045	8.3052	0.2833	0.8491
TLSF	8	12	28.101	13.705	0.2025	0.1727	0.7215
TCRA	8	12	0.054	0.069	0.504	0.4624	0.3054
TLCLL	7	12	110726	4.227	0.1726	0.0116	0
TLTA	8	12	0.487	3.337	0.3603	0.0401	0.8178
LLTL	7	12	0.072	0.115	0.4141	0.449	0.3379
RATA	8	12	0.684	0.641	0.6405	0.6259	0.7242
CATA	7	12	0.505	0.545	0.814	0.8027	0.6539
LLOE	7	12	0.342	0.818	0.1823	0.24	0.0872
OEOI	8	12	1.007	0.578	0.0045	0.0009	0.7874
OETA	8	12	0.101	0.054	0.0017	0.566	0.0001
OETC	8	12	5.665	2.32	0.1013	0.0748	0.7335
DERA	8	12	0.178	0.099	0.1979	0.1276	0.055
OESS	8	12	0.062	0.069	0.7871	0.7837	0.0001
OENB	8	12	2.561	0.8444	0.8422	0.0001	0.0001
OERB	7	9	4.692	7.77	0.2936	0.3007	0.1661
DVOI	8	12	0.01	0.018	0.4956	0.4903	0.911
TDOD	7	12	1.15	2.11	0.1446	0.2313	0.0043
TDTO	7	12	0.289	0.583	0.1012	0.1927	0
CSCD	7	12	2.571	1.986	0.5266	0.4654	0.2215
CSCSD	7	12	1.569	1.532	0.9602	0.9542	0.1915
TLCD	7	12	0.48	1.784	0.133	0.1063	0.8992
RBUB	8	12	0.633	0.488	0.4144	0.4213	0.6167
LIQI	8	12	0.67	0.584	0.2763	0.2758	0.6776
YTDNB	8	12	18.702	37.242	0.2609	0.3059	0.779
YTDSS	8	12	0.475	1.029	0.213	0.2674	0.0248

Table 6.16: Results of Univariate T-Test for BANK3 in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	6	14	-0.006	0.041	0.0165	0.0063	0.8313
NITC	6	14	-0.045	1.213	0.0225	0.0071	1
OITA	6	14	0.01	0.101	0.8513	0.8966	0.0084
OITC	6	14	5.595	4.022	0.4628	0.4633	0.8948
NISS	6	14	-0.004	0.095	0.1429	0.322	0
OISS	6	14	0.067	0.16	0.2522	0.4268	0.0034
OINB	6	14	2.521	5.819	0.2636	0.4278	0.0089
OIRB	5	11	3.486	11.462	0.0106	0.0456	0.0047
TLD	6	14	0.703	0.496	0.0388	0.0262	0.7477
CSTA	4	14	0.621	0.422	0.4824	0.3571	0.0896
GSTA	4	14	0.022	0.128	0.0099	0.0521	0.0024
TCTA	6	14	0.027	0.445	0.1415	0.1713	0.4159
TLSF	6	14	30.439	14.759	0.2329	0.1613	0.5078
TLCLL	6	13	12.898	4.263	0.0732	0.004	0
TCTA	6	14	0.531	0.339	0.0396	0.0116	0.6306
LLTL	6	13	0.054	0.12	0.1901	0.2427	0.2866
RATA	6	14	0.717	0.632	0.4429	0.3638	0.3651
CATA	5	14	0.434	0.565	0.5036	0.4507	0.6478
LLOE	6	13	0.289	0.806	0.1504	0.2179	0.1669
OEOI	6	14	1.058	0.617	0.0143	0.0017	0.6145
DETA	6	14	0.106	0.061	0.021	0.0024	0.4293
DETC	6	14	5.64	2.809	0.1845	0.1656	0.9296
OERA	6	14	0.189	0.105	0.2936	0.1303	0.0124
OESS	6	14	0.071	0.064	0.8241	0.8065	0.5911
OENB	6	14	2.623	2.421	0.8638	0.8504	0.6002
OERB	5	14	4.109	7.475	0.2025	0.2987	0.1352
DVOI	6	14	0.011	0.016	0.6671	0.6353	0.6064
TDCD	5	14	1.271	1.931	0.2762	0.4592	0.0362
TDTTD	5	14	0.298	0.537	0.1177	0.3381	0
CSCD	5	14	2.787	1.993	0.5296	0.3643	0.056
CSCSD	5	14	1.786	1.46	0.7467	0.6429	0.0516
TLCD	5	14	2.825	1.76	0.496	0.0185	1
RBUB	6	14	0.62	0.515	0.5566	0.5866	0.5887
LIOI	6	14	0.732	0.57	0.0403	0.0449	0.3998
TTDNB	6	14	20.67	33.747	0.4352	0.5043	0.2891
TTOSS	6	14	0.534	0.924	0.3663	0.4687	0.1324

found significant, the capital ratio TLCLL was found significant at 10% level, the risk ratio TCTA was found significant at 5% level, and of the managerial performance ratios only OEOI and OETA were significant at 5% level. The liability match was also retained as a significant determinant of bank performance. The ratio TDTTD was still found significant at 15% level. The revenue sources ratio was also found significant at 5% level. Again, LIOI was observed higher (73%) for vulnerable than for resistant banks (57%).

Comparing the significant determinants of bank performance according to the classification represented by BANK1, BANK2 and BANK3, the ratios NITA, NITC, TLD, GSTA, TLCLL and TCTA are most significant ratios. Others are OEOI, OETA and TDTTD. This means that profitability, liquidity, capital, risk, managerial performance and liability match ratios were significant determinants of bank performance in each classification.

Factors that are major determinants of bank performance according to BANK1, BANK2 and BANK3 classifications were also investigated for 1988. The results are shown in tables 6.17 to 6.19. All profitability ratios were observed to be statistically significant except OISS. NITA, NITC and NISS were statistically significant at 5% level, OITA was significant at 10% while OINB and OIRB were both significant at 15% level. Of the liquidity ratios only GSTA was found significant at 15% level. No capital ratio was significant while only LLTL was found significant among the risk and asset quality related ratios at 15% level. Also, among the managerial efficiency ratios only OEOI and DVOI were significant at 5% and 10% levels respectively. Also, TDTTD, used for assessing the match of deposit liabilities was significant at 5% level while both TTDNB and TTDSS were significant at 10% level in distinguishing the performance of banks based on BANK1 classification.

In relation to BANK2 classification, still in 1988, all profitability ratios were found significant at 5% level, only GSTA remained significant at the same level among the liquidity ratios, no capital or risk related ratio was found significant, the ratios OESS and OENB were both found significant in addition to OEOI and DVOI which were still confirmed significant at 5% levels as was the case for BANK1 while

Table 6.17: Results of Univariate T-Test for BANK1 in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	10	10	0.011	0.063	0.0003	0	0.0108
NITC	10	10	0.227	1.381	0.0005	0	0.0001
OITA	10	10	0.1	0.144	0.0951	0.0786	0.126
OITC	10	10	3.919	2.919	0.5363	0.5284	0
NISS	10	10	0.01	0.1	0.449	0.0318	0
OISS	10	10	0.072	0.24	0.1128	0.0959	0
OINB	10	10	2.621	7.285	0.1069	0.0902	0
OIRB	10	9	7.52	24.113	0.1417	0.104	0
TLD	10	10	0.546	0.433	0.2523	0.237	0.8281
CSTA	10	10	0.4112	0.441	0.8942	0.8927	0.0301
GSTA	10	10	0.053	0.16	0.1486	0.1316	0.0034
TCTA	10	10	0.047	0.056	0.5795	0.5726	0.768
TLSF	10	10	18.74	8.009	0.2538	0.2385	0
TCRA	10	10	0.106	0.101	0.9287	0.9277	0.6188
TLCLL	10	10	5.246	4.384	0.5714	0.5643	0.0785
TLTA	10	10	0.406	0.334	0.4099	0.3989	0.4981
LLTC	10	10	0.194	0.071	0.115	0.0981	0.0677
RATA	10	10	0.589	0.633	0.6708	0.6656	0.3267
LLOE	10	10	0.795	0.553	0.5646	0.5573	0.7334
OEOI	10	10	0.89	0.534	0.0002	0	0.0494
OETA	10	10	0.089	0.08	0.6926	0.6879	0.0859
OETC	10	10	3.692	1.538	0.2034	0.187	0
OERA	10	10	0.167	0.145	0.7671	0.7637	0.1372
OESS	10	10	62	0.14	0.2133	0.1972	0
OENB	10	10	2.243	4.288	0.406	0.225	0.0001
OERB	10	9	6.435	13832	0.2671	0.2268	0.0001
DVOI	10	10	0.004	0.039	0.0733	0.0578	0
TDOD	10	10	1.129	1.733	0.2187	0.2027	0.0004
TDOTD	10	10	0.325	0.451	0.0152	0.0079	0.123
CSCD	10	10	1.866	2.109	0.8122	0.8095	0.002
CSCSD	10	9	1.089	1.248	0.6984	0.6984	0.6423
TLCD	10	10	1.921	1.535	0.4161	0.4052	0.6009
RBUB	10	10	0.688	0.554	0.3499	0.3372	0.929
LJOI	10	10	0.619	0.596	0.7715	0.7682	0.1862
YTDNB	10	10	18751	36.6222	0.098	0.0814	0.0072
YTDSS	10	10	0.514	1.185	0.0847	0.0686	0.0023

Table 6.18: Results of Univariate T-Test for BANK2 in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	7	13	0.006	0.054	0.0001	0.0004	0.0018
NITC	7	13	0.164	2.149	0.0006	0.0026	0.0003
OITA	7	13	0.092	0.138	0.06646	0.0717	0.3748
OITC	7	13	4.838	0.655	0.3492	0.1807	0
NISS	7	13	0.004	0.083	0.0237	0.0767	0
OISS	7	13	0.05	0.213	0.0459	0.1237	0
OINE	7	13	1.85	60324	0.0349	0.0988	0
OIRB	7	12	6.011	20.845	0.0856	0.1647	0
TLD	7	13	0.541	0.462	0.4484	0.4288	0.8702
CSTA	7	13	0.309	0.49	0.3165	0.4209	0.0191
GSTA	7	13	0.038	0.143	0.1007	0.1581	0.0586
TCTA	7	13	0.034	0.06	0.1436	0.1444	0.6291
TLSF	7	13	23978	7.665	2245	0.0801	0
TCRA	7	13	0.073	0.12	0.2644	0.3451	0.074
TLCLL	7	13	6.358	3.985	0.2276	0.1186	0.0277
LLTL	7	13	0.142	0.127	0.8442	0.8513	0.6209
RATA	7	13	0.589	0.624	0.7434	0.716	0.4149
CATA	7	13	0.489	0.604	0.4944	0.4318	0.2871
LLOE	7	13	0.451	0.794	0.3167	0.4258	0.013
OEOI	7	13	0.932	0.594	0.0001	0.0002	0.0081
OETA	7	13	0.086	0.084	0.9206	0.9278	0.3724
OETC	7	13	4.674	1.506	0.1935	0.0574	0
OERA	7	13	0.144	0.165	0.6732	0.7537	0
OESS	7	14	0.046	0.13	0.0883	0.1826	0
OENB	7	13	1.706	4.105	0.0775	0.172	0.0001
OERB	7	12	5.448	12.558	0.166	0.2631	0.0016
DVOI	7	13	0.002	0.032	0.049	0.1247	0
TDCD	7	13	1.043	1.639	0.127	0.2311	0
TOTD	7	13	0.302	0.435	0.0061	0.0075	0.1259
CSCD	7	13	1.57	2.213	0.4395	0.5417	0.0125
CSCSD	7	12	0.713	1.428	0.0395	0.0709	0.0214
TLCD	7	13	1.969	1.598	0.4829	0.4465	0.79
RBUB	7	13	0.636	0.613	0.8741	0.8726	1
LIOI	7	13	0.657	0.581	0.3343	0.3574	0.5134
TTDNB	7	13	13.42	35.369	0.0377	0.0002	0
TTDSS	7	13	0.365	1.11	0.0143	0.0523	0

Table 6.19: Results of Univariate T-Test for BANK3 in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	6	14	0.004	0.052	0.0001	0.001	0.0007
NITC	6	14	0.145	1.086	0.0007	0.007	0.0011
OITA	6	14	0.087	0.137	0.0088	0.0595	0.5217
OITC	6	14	5.331	2.599	0.319	0.1032	0
NISS	6	14	0.003	0.078	0.0217	0.11	0
OISS	6	14	0.046	0.203	0.0405	0.1597	0
OINB	6	14	1.585	6.396	0.0223	0.1109	0
OIRB	6	13	4.532	20.386	0.0459	0.1517	0
TLD	6	14	0.555	0.461	0.4198	0.3683	0.6163
CSTA	6	14	0.307	0.478	0.335	0.4634	0.571
GSTA	6	14	0.008	0.149	0.0096	0.0651	0
TCTA	6	14	0.031	0.06	0.0907	0.083	0.7061
TLSF	6	14	27.074	7.504	0.2136	0.0405	0
TCRA	6	14	0.069	0.119	0.2495	0.3415	0.1624
TLCLL	6	14	7.058	3.854	0.1475	0.0377	0.0272
TLTA	6	14	0.393	0.36	0.7802	0.7232	0.1262
LLTL	6	14	0.12	0.138	0.818	0.8282	0.6906
RATA	6	14	0.572	0.628	0.6682	0.6039	0.252
CATA	6	14	0.408	0.631	0.1993	0.1321	0.5169
LLOE	6	14	0.369	0.804	0.1813	0.3299	0.0152
OE01	6	14	0.945	0.613	0.0001	0.0006	0.007
OETA	6	14	0.083	0.85	0.9052	0.9133	0.5688
OETC	6	14	5.186	1.513	0.1994	0.0319	0
OERA	6	14	0.143	0.164	0.6371	0.7518	0.0012
OESS	6	14	0.044	0.125	0.07	0.2189	0
OENB	6	14	1.5	4.022	0.0454	0.1676	0
OERB	6	13	4.236	12.571	0.0754	0.2038	0.0001
DVOI	6	14	0	0.031	0.0266	0.1246	0
TDCD	6	14	1.098	1.573	0.1953	0.3641	0.004
TOTTD	6	14	0.318	0.418	0.0215	0.0661	0.0257
CSCD	6	14	1.586	2.16	0.48	0.6012	0.0404
CSCSD	6	13	0.708	1.375	0.0525	0.1079	0.0585
TLCD	6	14	2.032	1.598	0.4648	0.3912	0.3919
RBUB	6	14	0.692	0.59	0.5085	0.5044	0.9481
LI01	6	14	0.687	0.573	0.1582	0.1844	0.4674
TTDNB	6	14	12.044	34.391	0.0053	0.0427	0
TTDSS	6	14	0.354	1.061	0.013	0.0796	0

for liability match category of ratios only TDTTD and TLCD were found significant at 5% and 10% levels respectively.

The number of significant ratios increased in the case of BANK3 classification. all the profitability ratios remained significant at 5% level, only the GSTA remained significant at 5% level among the liquidity ratios, TCTA and TLCLL were significant at 10% and 5% levels in the class of capital ratios, CATA was significant at 15% level as a risk ratio while only OESS, OENB, OERB were significant at 5% level in the class of managerial efficiency indicators. As for liability match, with respect to the BANK3 classification in 1988, only the ratios TDTTD and CSCSD were significant at the 5% and 10% levels respectively. Also, TTDNB and TTDSS were significant at 5% level.

The above discourse in relation to the significant determinants of bank performance based on the classification represented by BANK1, BANK2 and BANK3 confirms the key role played by profitability, liquidity, managerial efficiency and liability match as at 1988.

From table 6.20 to 6.22 and the summary contained in 6.23 we observe that liability match had ceased to become important as a determinant of bank performance by 1989. Prior to 1989, we observed that the ratio of time deposits to current deposits (TDCD) was significantly higher for resistant banks than vulnerable banks. A close look at the 1989 figures reveals an insignificant difference for both categories of banks. The same trend was observed using the TDTTD ratio. Resistant banks tended to reflect higher proportion of time deposits in their aggregate deposit base. We had found a trend, going by table 6.7, which reflected a deliberate change in the structure and composition of bank deposit liabilities. Specifically, both the ratio of time to current deposits (TDCD) and time to total deposits (TDTTD) were consistently reduced, infact to the lowest levels ever since 1985. This development perhaps is responsible for the relative insignificance of liability match in distinguishing between vulnerable and resistant banks.

In relation to BANK1, the profitability ratios NITA, OITA and NISS were significant at 5%, 10% and 15% levels respectively in 1989. Bank liquidity expressed

Table 6.20: Results of Univariate T-Test for BANK1 in 1989

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	10	10	0.005	0.086	0.0062	0.0023	0.2456
NITC	10	10	1.606	1.07	0.6048	0.5984	0.5984
OITA	10	10	0.13	0.213	0.0518	0.0379	0.0007
OITC	10	10	12.986	2.359	0.3618	0.3494	0
NISS	10	10	0.012	0.121	0.1334	0.1163	0
OISS	10	10	0.107	0.232	0.202	0.1856	0.0001
OINB	10	10	3.646	5.433	0.353	0.3404	0.0014
OIRB	10	10	9.549	15.065	0.4129	0.4019	0.0005
YLD	10	10	0.52	0.591	0.6541	0.6486	0.1499
CSTA	10	10	0.361	0.461	0.4289	0.4183	0.697
GSTA	1	10	0.029	0.125	0.1004	0.0838	0.0016
TCTA	10	10	0.013	0.097	0.0081	0.0033	0.3287
TCRA	10	10	0.141	0.21	0.6206	0.6145	0.0043
TLCLL	10	10	4.728	3.071	0.1063	0.0869	0.7311
TLTA	10	10	0.392	0.394	0.9832	0.983	0.1515
LLTL	10	10	0.202	0.137	0.3999	0.3886	0.5102
RATA	10	10	0.637	0.527	0.2772	0.2625	0.086
CATA	10	10	667	0.588	0.5255	0.5173	0.5637
LLOE	10	10	0.926	0.557	0.0191	0.0106	0.032
OEOI	10	10	0.926	0.577	0.0191	0.0106	0.032
OETA	10	10	0.125	0.127	0.9576	0.957	0.2429
OETC	10	10	11.38	1.289	0.3438	0.3309	0
OERA							
OESS	10	10	0.094	0.111	0.06156	0.6094	0.1251
OENB	10	10	3.233	2.616	0.4065	0.3953	0.734
OERB	10	10	8.536	6.774	0.478	0.4687	0.4917
DVOI	10	10	0.009	0.051	0.086	0.0699	0.0004
TDCD	10	10	0.875	1.033	0.6881	0.6833	0.0038
TDTTD	10	10	0.244	0.321	0.3131	0.2994	0.0927
CSCD	10	10	2.128	1.816	0.7136	0.7093	0.0614
CSCSD	10	10	1.263	1.176	0.8888	0.8873	0.0075
TLCD	10	10	1.775	1.656	0.8082	0.8054	0.0071
RBUB	10	10	0.847	0.9	0.8201	8175	0.4036
LIOI	10	10	0.576	0.519	0.5323	0.5243	0.7289
TTDNB	10	10	22.498	16.46	0.2138	0.1976	0.3643
TTDSS	10	10	0.629	0.699	0.702	0.6974	0.1392

Table 6.21: Results of Univariate T-Test for BANK2 in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	8	12	-0.005	0.079	0.0123	0.0021	0.1559
NITC	8	12	1.639	1.137	0.6997	0.6292	0
OITA	8	12	0.126	0.202	0.0427	0.071	0.0017
OITC	8	12	15.101	2.72	0.403	0.2836	0
NISS	8	12	0.004	0.108	0.0857	0.0385	0.0001
OISS	8	12	0.091	0.221	0.1154	0.1781	0
OINE	8	12	3.317	5.354	0.2172	0.2852	0.0039
OIRB	8	12	9.873	13.93	0.4832	0.5478	0.006
TLD	8	12	0.45	626	0.2052	0.2625	0.0163
CSTA	8	12	0.439	0.392	0.6973	0.7125	0.3624
GSTA	8	12	0.036	0.104	0.1818	0.2404	0.0094
TCTA	8	12	0.008	0.086	0.0286	0.0093	0.2429
TLSF	8	12	60.528	6.586	0.3802	0.2601	0
TCRA	8	12	0.166	0.181	0.9266	91107	0.001
TLCLL	8	12	4.292	3.637	0.5334	0.5257	0.9925
LLTL	8	12	0.365	0.412	0.5716	0.5959	0.2732
RATA	8	12	0.229	0.13	0.2063	0.1951	0.8444
CATA	8	12	0.605	0.567	0.7421	0.7134	0.1793
LLOE	8	12	0.649	0.613	0.7878	0.775	0.5361
OEOI	8	12	0.665	0.607	0.861	0.8787	0.0278
OETA	8	12	0.131	0.123	0.8528	0.8578	0.5307
OETC	8	12	13.462	1.583	0.3801	0.26	0
OERA	8	12	0.483	0.261	0.4829	0.4001	0.009
OESS	8	12	0.088	0.113	0.4037	0.4514	0.0754
OENB	8	12	3.168	2.764	0.5859	0.589	0.733
OERB	8	12	9.251	6.592	0.2874	0.2792	0.8373
DVOI	8	12	0.011	0.043	0.1381	0.1956	0.0032
TOCD	8	12	0.856	1.018	0.6349	0.682	0.13
TDTT	8	12	0.226	0.321	0.1848	0.2044	0.2549
CSCD	8	12	2.612	1.545	0.2765	0.2022	0.0603
CSCSD	8	12	1.543	1.004	0.4715	0.3842	0.0052
TLCD	8	12	1.728	1.707	0.6916	0.9662	0.0476
RBUB	8	12	0.658	1.017	0.0847	0.1091	0.614
LIOI	8	12	0.532	0.557	0.7843	0.7843	0.7339
TTDNB	8	12	22.135	17.708	0.4126	0.3604	0.2328
TTOSS	8	12	0.602	0.705	0.5526	0.57	0.4072

Table 6.22: Results of Univariate T-Test for BANK3 IN 1989

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Vulnerable	Resistant	Vulnerable	Resistant			
NITA	6	14	-0.015	0.071	0.0384	0.0032	0.0968
NITC	6	14	2.001	1.054	0.5934	0.5934	0.3903
OITA	6	14	0.12	0.194	0.0305	0.0988	0.0124
OITC	6	14	19.113	2.769	0.4211	0.1816	0
NISS	6	14	-0.033	0.096	0.0662	0.0909	0.0021
OISS	6	14	0.076	0.209	0.0595	0.1965	0
OINB	6	14	2.963	5.214	0.1256	0.2688	0.0082
OIRB	6	14	9.558	13.485	0.4603	0.5866	0.0358
TLD	6	14	0.447	0.602	0.2081	0.3586	0.0171
CSTA	6	14	0.42	0.407	0.3603	0.4895	0.0526
GSTA	6	14	0.046	0.090	0.3603	0.4895	0.0526
TCTA	6	14	-0.005	0.081	0.0539	0.0071	0.1151
TLSF	6	14	77.973	6.816	0.3985	0.1605	0
TCRA	6	14	0.201	0.614	0.874	0.8074	0.0001
TLCLL	6	14	3.867	3.913	0.9629	0.9669	0.4767
TLTA	6	14	0.353	0.411	0.4587	0.5455	0.1773
LLTL	6	14	0.277	0.123	0.0707	0.0502	0.9032
RATA	6	14	0.532	0.604	0.5749	0.5084	0.3502
CATA	6	14	0.578	0.649	0.6414	0.5941	0.4539
LLOE	6	14	0.82	0.549	0.3781	0.509	0.0458
OEOI	6	14	1.045	0.611	0.0666	0.0051	0.0074
OETA	8	14	0.135	0.122	0.8074	0.8017	0.9038
OETC	6	14	17.113	1.715	0.407	0.1682	0
OERA	6	14	0.593	0.246	0.4073	0.2123	0.0013
OESS	6	14	0.079	0.113	0.2316	0.3396	0.1025
OENB	6	14	3.021	2.884	0.861	0.8649	0.8251
OERB	6	14	9.358	6.925	0.3788	0.3569	1
DVOI	6	14	0.006	0.04	0.0638	0.1922	0.001
TDOD	6	14	0.834	1.005	0.6035	0.6871	0.0995
TDTTD	6	14	0.246	0.298	0.4777	0.5202	0.4782
CSCD	6	14	2.042	1.942	0.8993	0.9135	0.3433
TLCD	6	14	1.506	1.805	0.4363	0.5661	0.0355
RBUB	6	14	0.634	0.977	0.1074	0.1556	0.2348
LIOI	6	14	0.494	0.57	0.384	0.4357	0.4146
TTDNB	6	14	20.658	18.974	0.7828	0.7473	0.3582
TTOSS	6	14	0.524	0.724	0.2243	0.2978	0.2342

Table 6.23: Summary of Significant Variables for Different Performance Classifications
Based on the T-Test (1985-1989)

Variable	1985	1986	1987	1988	1989	Common Variables
BANK1	NITA*,NITC*,NISS*	NITA*,NITC*	NITA**,NITC*, OITC*	NITA*,NITC*,*OITA**	NITA*,OITA**	NITA
	OISS*,OINB*,OIRB*	OISS***, OINB**	TLD*,CSTA**,GSTA**	NISS*,OISS***,	NISS**,GSTA**	NITC,
	GSTA*,OEOI*,OETA*	OIRB*,GSTA*,TLSF**	TLSF*TLCLL**,TLTA*	OINB***,OIRB***,	TCTA*,	GSTA,
	OERA*,OENB**	TLCLL**,TLTA*	OEOI*,OETA*,OETC*	GSTA***,LLTL***,	TLCLL**,OEOI*,	OEOI,DVOI,
	DVOI*,TDCD*,	OEOI*,OETA*,OETC*	OERA*,TDCD**	OEOI*,DVOI**	DVOI**	
	TTDNB**,TTDSS**	OERA*,OERB**	TDITD***,TTDSS*	TDITD*,TTDNB**		
		DVOI***, LIOI*		TTDSS*		
BANK2	NITA*,NITC*	NITA*,NITC*,NISS**	NITA*,NITC*,OIRB*	NITA*,NITC*,OITA**	NITA*,OITA*, NISS*	NITA,
	OITA***, NISS*	OINB***,CSTA***	TLD**,GSTA***,	NISS*,OISS*,OINB*	OISS***,TCTA*,	NITC,
	OISS*,OINB*	GSTA**,TLSF***,	TLCLL**,TLTA*,	OIRB*,GSTA*	OEOI*,RBUB**	OEOI,
	CSTA*,OEOI*	TLTA*,OEOI*,OETA*	OEOI*,	OEOI*,OESS*		
	OETA*,OERA*	OETC**,OERA*,	OETA*,OETC**	OENB*,DVOI*		
	OERB*,DVOI*,TDCD TTDNB***,TTDSS***	OERB**,LIOI*	OERA***	TDCD*,TDITD**,CSCSD *TTDNB*,TTDSS		
			TDITD*,TLCD***	TTDNB*,TTDSS*		
BANK3	NITA*,NITC*,OITA*	NITA*,NITC*,NISS*	NITA*,NITC*,TLCLL*	NITA*,NITC*,OITA**	NITA*,OITA*, NISS**	NITA,
	NISS*,OISS*,OIRB*	OISS*,OIRB*,TLD*	TLTA*,OEOI*,OETA*,	NISS*,OISS*	OISS**,OINB***	NITC
	GSTA*,OEOI**, OETA*	GSTA*,TLTA*,OEOI*,	TDITD***,LIOI*	OINB*,OIRB*	TCTA**,LLTL**,	OEOI
	DVOI*,TDCD*,	OETA*,OETC*,OERA*		GSTA*,TCTA**	OEOI*,DVOI*	DVOI,
	TTDNB*,TTDSS*,	OERB*,DVOI*		TLCLL**		
		TDCD***,TDITD*		CATA***,OESS*,		
		LIOI**		OENB*,OERB**,DVOI*		
				TDITD*,CSCSD**		
				TTDNB*,TTDSS*		
Common Variables	NITA,NITC,NISS,	NITA,NITC,GSTA,	NITA,NITC,TLD,	NITA,NITC,OITA,	NITA,OITA,NISS	NITA,
	OISS,	OEOI,	GSTA,TLCLL,TLTA	NISS,OISS,OINB,	TCTA,OEOI,	OEOI
	OEOI,OETA,DVOI	OETA,OETC,OERA,	OEOI,OETA,TDITD,	OIRB,GSTA,		
	TDCD,TTDNB,TTDSS	OERA,LIOI		DVOI*,TDITD,TTDNB,		
				TTDSS.		

Notes: * implies variable is significant at 5% level
 ** implies variable is significant at 10% level
 *** implies variable is significant at 15% level.

by GSTA was also significant at 10% level. Capital adequacy represents also a significant determinant of bank performance going by BANK1 classification due to the statistical significance at 5% and 10% levels respectively of TCTA and TLCLL. Among the managerial efficiency ratios, OEOI and DVOI were statistically significant at 5% and 10% levels.

The ratio OISS was found significant statistically in distinguishing between the categories of banks according to the BANK2 classification in addition to NITA, OITA and NISS which were also observed significant according to BANK1 classification. OISS was however significant at 15% level. The capital ratio, TCTA was also found significant at 5% level. Only the managerial efficiency ratio, OEOI, was observed to be statistically significant at 5% level. The branch structure variable, RBUB was found to be statistically significant at 10% level. We find that resistant banks on the average had a higher rural to urban branch ratio than the vulnerable banks. The average for resistant banks by BANK2 classification was 102.7% compared with 65.8% for vulnerable banks.

For BANK3 classification, the ratio OINB was found statistically significant at 15% in addition to profitability ratios shown to be significant according to BANK2 classification. The capital ratio, TCTA remained significant at 10% level, the asset quality ratio, LLTL, was also significant at 10% level while both OEOI and DVOI, being managerial efficiency indicators were significant at 5% level. Just as was the case for BANK2, no liquidity ratio was found significant in distinguishing the performance of banks which belong to the two categories.

We find that profitability, capital adequacy and managerial efficiency were central to bank performance in 1989 going by all the classifications BANK1, BANK2 and BANK3. Neither liquidity nor asset quality made any difference. This is not really in line with our expectations. In particular, one had expected liquidity to be a significant factor due to the liquidity crisis which many faced in 1989 as a result of the withdrawal of government funds from the banks as well as the liquidity squeeze which has characterised CBN policy orientation since the adoption of SAP.

Perhaps, the observed insignificance reflects the fact that the liquidity squeeze

is an industry-wide policy which has had an effect on virtually all banks. In reality however, the effect was more serious for some banks such as National Bank than for others. Statistically, the few adverse cases may not be sufficient to distinguish vulnerable from resistant banks.

A look at table 6.23 reveals that both bank profitability and managerial efficiency have been significant determinants of bank performance all through the study horizon. Specifically, the significant profitability ratios are NITA and NITC while the significant managerial efficiency ratio was OEOI. Liability match was significant in 1985 as well as in both 1987 and 1988 while capital adequacy was significant in 1987 and 1989. Liquidity was significant between 1986 and 1988. The prominent ratio in this regard is the government securities holding to total assets ratio. The most significant profitability ratios throughout this period was NITC and NITA. Actually one may not be surprised at the significance of NITA since our different classifications are based on it. Asset quality was significant only in 1987, with the ratio TLTA. The deposit per branch and deposit per staff indicators were significant in 1985 as well as in 1987 and 1988.

6.4 Bank Ownership, Head-Office Location and Technical Partnership: A Univariate Analysis

Our study also sought to determine the main factors that distinguish the performance and characteristics of banks predominantly publicly-owned from those that are predominantly privately-owned; those whose head-offices are located in Lagos from those with head-offices outside Lagos; those with technical partnership agreements from those without. The results of the univariate analyses are displayed in Tables 6.24 to 6.38 with the summary of significant distinguishing factors for the period 1985 to 1989 presented in Table 6.39.

By 1985, profitability, liquidity and branch structure distinguished predominantly public banks from predominantly private banks. The operating income per staff (OISS), the operating income per branch (OINB) and OIRB were significant in distinguishing between the two categories of banks according to their

Table 6.24: Results of Univariate T-Test for ROWN IN 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Public	Private	Public	Private			
NITA	13	5	0.017	0.027	0.4392	0.5926	0.0395
NITC	13	5	0.459	0.009	0.2897	0.2407	0.7983
OITA	13	5	0.087	0.082	0.6038	0.6224	0.7758
OITC	13	5	2.457	3.081	0.6002	0.5642	0.7012
NISS	13	5	0.011	0.047	0.1166	0.0243	0.1361
OISS	13	5	0.037	0.122	0.0163	0.0001	0.0293
OINB	13	5	1.386	6.112	0.0596	0.0007	0
OIRB	11	3	4.503	13.936	0.1385	0.0081	0.2192
TLD	13	5	0.635	0.391	0.0449	0.0437	0.4885
CSTA	13	5	0.374	0.324	0.7545	0.7485	1
GSTA	13	5	0.131	0.317	0.1377	0.0468	0.2813
TCTA	13	5	0.054	0.034	0.1699	0.3113	0.0651
TLSF	13	5	14.445	10.294	0.4121	0.5589	0.063
TCRA	13	5	0.131	0.528	0.3194	0.528	0.0006
TLCLL	12	5	6.187	4.964	0.3643	0.4965	0.0847
TLTA	13	5	0.485	0.308	0.0544	0.0733	0.3286
LLTL	12	5	0.084	0.098	0.7896	0.7744	0.7558
RATA	13	5	0.691	0.659	0.7905	0.7657	0.6009
CATA	13	5	0.592	0.411	0.3756	0.3337	0.8081
LLOE	12	5	0.72	0.544	0.6236	0.6803	0.3356
OEOI	13	5	0.929	0.656	0.2156	0.3912	0.0259
OETA	13	5	0.07	0.054	0.2053	0.2472	0.4671
OETC	13	5	1.998	2.072	0.9342	0.9423	0.5156
OERA	13	5	0.122	0.098	0.5961	0.6552	0.3777
OESS	13	5	0.026	0.074	0.0075	0	0.0462
OENB	13	5	0.975	3.447	0.0165	0	0.0004
OERB	11	5	3.11	9.014	0.125	0.0149	0.48
DVOI	13	5	0.009	0.029	0.2876	0.7311	0.0853
TDCO	13	5	0.935	1.836	0.0354	0.006	0.6254
TDTTD	13	5	0.323	0.533	0.1308	0.0273	0.0958
CSCD	13	5	1.409	1.486	0.902	0.9002	1
CSCSD	13	5	0.956	1.333	0.514	0.4435	0.4898
TLCD	13	5	1.8	1.648	0.7992	0.746	0.2172
RBUB	14	5	0.609	0.344	0.2174	0.1743	0.787
LTOI	13	5	5.913	0.579	0.3366	0.5509	0
TTDNB	13	5	11.491	63.001	0.0967	0.0023	0
TTDNB	13	5	0.31	1.216	0.0294	0.0001	0

ownership. The ratios were higher for predominantly private banks than for the predominantly public banks. Liquidity was also found to be a significant distinguishing characteristic at 5% level. In this regard the ratios TLTA and TLD were significant. Going by the ratios, public banks are generally less liquid than private banks. The branch structure ratios TTDNB and TTDSS (as they could be called) were found significant to distinguish the two categories of banks. The deposit per staff (TTDSS) averaged N1.216 million for private banks compared with an average of N0.310 million for public banks. The same trend is observed for deposit per branch (TTDNB).

The ratios OISS and OINB remained significant at 5% and 15% levels respectively in 1986; TLD and GSTA also remained significant statistically at 10% and 15% level while TTDNB and TTDSS were also found significant at 15% and 10% levels respectively. In addition to these factors both risk and managerial efficiency were found to be important factors in distinguishing public from privately owned banks. Specifically, the risk ratio, TLTA, was significant at 15% level while the managerial efficiency ratios OESS, OENB and OERB were all significant at 5% level. In each of the cases the ratios are higher for private than for public banks. In the main, this development reveals the fact that remuneration in the private banks is substantially higher than in public banks. The liability match ratio, TDCD, also remained significant at 10% level. In this regard private owned banks have on the average N2.08 of time deposits for every N1.00 of current deposit compared with N1.27 for public banks. We recall that we had observed previously higher TDCD ratio for resistant than for vulnerable banks.

A similar set of factors were observed significant in distinguishing private from publicly owned banks in 1987 (Table 6.26). The profitability ratios remained significant, that is, OINB and OIRB, at 5% level. The same applied to the liquidity ratio (TLD), the risk ratio (TCTA), the managerial efficiency ratios (OESS, OENB and OERA) and branch structure or bank size ratios (TTDNB and TTDSS). Public banks are observed to be associated with higher levels of risk since they have on the average 45% of their assets as loans while private banks recorded, on the average

Table 6.25: Results of Univariate T-Test for ROWN in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Public	Private	Public	Private			
NITA	14	6	0.016	0.028	0.5202	0.5276	0.8248
NITC	14	6	0.555	0.697	0.7705	0.7302	0.3197
OITA	14	6	0.085	0.088	0.7131	0.6926	0.7152
OITC	14	6	2.562	2.596	0.9593	0.9715	0.012
NISS	14	6	0.014	0.092	0.2989	0.0882	0
OISS	14	6	0.041	0.193	0.0853	0.0037	0
DINB	14	6	1.566	8.496	0.129	0.0106	0
OIRB	14	3	4.783	13.824	0.1111	0.005	0.3246
TLD	14	6	0.681	0.485	0.0971	0.083	0.8032
CSTA	14	6	0.351	0.279	0.5558	0.5889	0.5438
GSTA	14	6	0.066	0.218	0.1407	0.0239	0.0024
TCTA	14	6	0.058	0.037	0.1849	0.3349	0.0144
TLSF	14	6	14.993	10.623	0.4259	0.5546	0.0403
TCRA	14	6	0.102	0.054	0.1943	0.3711	0.0016
TLCLL	13	6	6.165	6.586	0.8347	0.8258	0.7825
TLTA	14	6	0.488	0.346	0.1263	0.1103	0.8538
LLTL	13	6	0.095	0.073	0.6572	0.6747	0.6579
RATA	14	6	0.679	0.756	0.517	0.4568	0.4624
CATA	12	6	0.582	0.517	0.7274	0.7213	1
LLOE	13	6	0.819	0.445	0.3299	0.4155	0.1716
OEOI	14	6	0.904	0.713	0.4685	0.5606	0.147
OETA	14	6	0.069	0.061	0.584	0.588	0.8713
OETC	14	6	2.007	1.899	0.8958	0.9166	0.1631
OERA	14	6	0.108	0.078	0.1229	0.257	0.0138
OESS	14	6	0.027	0.1	0.0051	0	0.0001
OENB	14	6	1.048	4.092	0.0099	0	0
OERB	12	6	3.018	8.506	0.1153	0.0064	0.3499
DVOI	14	6	0.013	0.063	0.3027	0.0981	0
TOCO	13	6	0.997	2.082	0.0685	0.005	0.0012
TDTTD	13	6	0.324	0.414	0.303	0.1509	0.0178
CSCD	13	6	1.267	2.802	0.2375	0.0878	0.006
CSCSD	13	6	0.774	6.626	0.1528	0.0263	0
TLCD	13	6	2.144	2.735	0.4981	0.339	0.0071
RBUB	14	6	0.63	0.354	0.1963	0.152	0.776
LIOI	14	6	0.6	0.591	0.9384	0.9236	0.296
TTDNB	14	6	13.017	64.317	0.1115	0.0076	0
TTDNB	14	6	0.337	1.487	0.0666	0.002	0

Table 6.26: Results of Univariate T-Test for ROWN in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Public	Private	Public	Private			
NITA	14	6	0.0196	0.042	0.2934	0.2241	0.0001
NITC	14	6	0.675	1.212	0.2857	0.2909	0.7626
OITA	14	6	0.099	0.103	0.8322	0.7569	0.0001
OITC	14	6	4.838	3.691	0.4836	0.5938	0.0689
NISS	14	6	0.013	0.187	0.2834	0.0745	0
OISS	14	6	0.054	0.314	0.1579	0.0172	0
OINB	14	6	1.923	11.61	0.1356	0.0117	0
OIRB	13	6	7.547	15.134	0.1789	0.1194	0.9522
TLD	14	6	0.633	0.384	0.0209	0.0059	0.8999
CSTA	14	6	0.541	0.344	0.2479	0.3631	0.0862
GSTA	14	6	0.068	0.164	0.2158	0.0825	0.0353
TCTA	14	6	0.042	0.034	0.4386	0.3325	0.1503
TLSF	14	6	23.09	11.001	0.1705	0.2891	0.0534
TCRA	14	6	0.068	0.053	0.413	0.4859	0.2702
TLCLL	13	6	7.997	4.807	0.2233	0.3397	0.0516
TLTA	14	6	0.451	0.27	0.0358	0.0187	0.9135
LLTL	13	6	0.096	0.107	0.8473	0.8505	0.8386
RATA	14	6	0.637	0.707	0.5397	0.4581	0.0001
CATA	13	6	0.523	0.545	0.901	0.8994	0.0001
LLOE	13	6	0.693	0.533	0.6595	0.709	0.2509
OEOI	13	6	0.8	0.632	0.2519	0.2886	0.4795
OETA	14	6	0.08	0.06	0.1724	0.234	0.253
OETC	14	6	4.164	2.479	0.3074	0.4176	0.1082
OERA	14	6	0.149	0.086	0.1081	0.2629	0.0013
OESS	14	6	0.041	0.127	0.0079	0.0001	0.136
OENB	14	6	1.444	4.902	0.0106	0.0001	0.0262
OERB	13	3	5.5	10.424	0.2074	0.1957	0.7816
DVOI	14	6	0.012	0.021	0.4943	0.4391	0.5273
TDCD	13	6	1.276	2.8	0.22	0.0595	0.0001
TDTTD	13	6	0.356	0.731	0.3046	0.1044	0
CSCD	13	6	2.07	2.486	0.6601	0.6191	0.4752
CSCSD	13	6	1.258	2.169	0.2813	0.1596	0.0984
TLCD	13	6	2.204	1.685	0.3107	0.2543	0.605
RBUB	14	6	0.603	0.412	0.4045	0.3162	0.3189
LIOI	14	6	0.603	0.412	0.4045	0.3162	0.3189
TTDNB	14	6	13.538	67.832	0.0618	0.0015	0
TTOSS	14	6	0.378	1.809	0.0798	0.0029	0

27.0%. Public banks are also less liquid given the average loan to deposit ratio (TLD) as 63.3% compared with 38.4% for private banks. As a ratio of risk assets, operating expenses is higher on the average for public banks (₦0.149 million) than for private banks (₦0.086 million).

The distinguishing factors changed slightly by 1988 as shown in table 6.27. Profitability, managerial efficiency and branch structure/size remained significant factors with virtually the same set of variables. Capital adequacy and asset quality were observed significant in addition to the above groups of factors. With regard to capital adequacy, the ratio TLCLL was found significant at 10% level while the asset quality ratio RATA was also significant at 10% level. The capital position of public banks can be said to have been worse than that of private banks as TLCLL averaged 538.4% and 348.8% respectively for the different categories of banks. The RATA averaged 72.5% for private banks and 56.2% for public banks.

By 1989, the same set of factors observed significant in 1988 were significant except for capital adequacy (Table 6.28). The asset quality ratios LLTL and LLOE were observed significant at 5% and 10% levels respectively. In both cases, higher average values were associated with public than with private banks, indicating that the quality of assets of private banks is higher than for public banks. Among the managerial efficiency ratios, an additional ratio, DVOI, was found significant at 5% level. Privately owned banks had an average of 7.3% compared with 0.7% for public banks.

In summary, between 1985 and 1989, profitability, liquidity, asset quality and managerial efficiency in addition to branch structure and size were significant factors that distinguished predominantly public from predominantly private banks. Private banks are confirmed to be more profitable, more liquid, more efficient and have better quality assets. The specific ratios that were predominantly significant include OINB, OISS, TLD, OESS as well as TTDNB and TTDSS.

In 1985, a comparison between banks with head-office located in Lagos and those located outside Lagos reveals that the distinguishing factors are profitability (NITA and NITC), managerial efficiency (OEOI and OETA) and match of liability

Table 6.27: Results of Univariate T-Test for ROWN in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Public	Private	Public	Private			
NITA	14	6	0.039	0.035	0.7719	0.8323	0.0367
NITC	14	6	0.813	0.784	0.917	0.94	0.0301
OITA	14	6	0.124	0.116	0.6931	0.7634	0.0801
OITC	14	6	3.775	2.588	0.3177	0.4924	0.0026
NISS	14	6	0.028	0.12	0.22	0.0458	0
OISS	14	6	0.077	0.341	0.1359	0.012	0
OINB	14	6	2.611	10.417	0.1003	0.0055	0
OIRB	13	6	7.291	32.907	0.1273	0.0141	0
TLD	14	6	0.515	0.429	0.4756	0.4088	0.4394
CSTA	14	6	0.493	0.272	0.2148	0.3408	0.0535
GSTA	14	6	0.062	0.209	0.1897	0.0538	0.0096
TCTA	14	6	0.053	0.048	0.6832	0.7637	0.0427
TLSF	14	6	16.06	7.109	0.2044	0.3715	0.0052
TCRA	14	6	0.119	0.068	0.166	0.3309	0.0036
TLCLL	14	6	5.384	3.488	0.1371	0.2377	0.073
TLTA	14	6	0.402	0.296	0.2812	0.2473	0.8597
LLTL	14	6	0.15	0.091	0.4191	0.4814	0.3373
RATA	14	6	0.562	0.725	0.0846	0.1213	0.2548
CATA	14	6	0.566	0.559	0.965	0.9661	0.8123
LLOE	14	6	0.566	0.559	0.965	0.9661	0.8123
OEOI	14	6	0.718	0.699	0.8129	0.8672	0.0158
OETA	14	6	0.086	0.081	0.7769	0.8342	0.0464
OETC	14	6	2.962	1.804	0.342	0.5235	0.0005
OERA	14	6	0.177	0.112	0.1581	0.3317	0.0009
OESS	14	6	0.049	0.221	0.0948	0.0046	0
OENB	14	6	1.722	6.868	0.0643	0.0017	0
OERB	14	6	4.709	21.271	0.0884	0.0059	0
DVOI	14	6	0.011	0.047	0.2326	0.0095	0.0017
TDCD	14	6	1.474	1.329	0.7307	0.7825	0.1643
TDTTD	14	6	0.374	0.421	0.4911	0.4025	0.3042
CSCD	14	6	2.207	1.475	0.4018	0.5042	0.1258
CSCSD	14	6	1.034	1.529	0.3901	0.2686	0.2743
TLCD	14	6	1.95	1.211	0.0808	0.1367	0.1436
RBUB	14	6	0.638	0.582	0.6971	0.7164	0.6333
LIOI	14	6	0.627	0.563	0.5476	0.4635	0.2448
TTDNB	14	6	17.139	52.299	0.0323	0.0004	0
TTDSS	14	6	0.5	1.664	0.06	0.0015	0

Table 6.28: Results of Univariate T-Test for ROWN in 1989

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Public	Private	Public	Private			
NITA	13	7	0.036	0.062	0.3829	0.4021	0.5736
NITC	13	7	1.607	0.837	0.3338	0.4686	0
OITA	13	7	0.179	0.158	0.5873	0.6477	0.0987
OITC	13	7	10.44	2.533	0.3714	0.5093	0
NISS	13	7	0.024	0.146	0.2401	0.0906	0
OISS	13	7	0.098	0.301	0.1444	0.0326	0
OINB	13	7	2.922	7.540	0.0848	0.0111	0
OIRB	13	7	8.063	20.188	0.1974	0.0682	0
TLD	13	7	0.569	0.53	0.8035	0.8112	0.6591
CSTA	13	7	0.433	0.369	0.6292	0.6242	0.9896
GSTA	13	7	0.062	0.104	0.5268	0.4924	0.5964
TCTA	13	7	0.047	0.07	0.413	0.4953	0.0659
TLSF	13	7	40.391	5.454	0.3422	0.4825	0
TCRA	13	7	0.2	0.129	0.524	0.6216	0.0058
TLCLL	13	7	4.263	3.223	0.2635	0.3222	0.1782
TLTA	13	7	0.449	0.29	0.0672	0.0701	0.4522
LLTL	13	7	0.218	0.08	0.0354	0.0694	0.0294
RATA	13	7	0.542	0.657	0.299	0.2623	0.7197
CATA	13	7	0.636	0.61	0.8283	0.8389	0.5233
LLOE	13	7	0.82	0.278	0.0874	0.1597	0.0139
OEOI	13	7	0.794	0.644	0.2809	0.3571	0.0940
OETA	13	7	0.142	0.096	0.1953	0.3122	0.0027
OETC	13	7	8.833	1.695	0.3778	0.515	0
OERA	13	7	0.456	0.152	0.1331	0.2571	0
OESS	13	7	0.074	0.156	0.0522	0.009	0.0286
OENB	13	7	2.241	4.197	0.0228	0.0046	0.3471
OERB	13	7	6.215	10.329	0.1445	0.0957	0.5065
DVOI	13	7	0.007	0.073	0.0489	0.0035	0
TDOD	13	7	1.053	0.769	0.4158	0.4812	0.1469
TDTO	13	7	0.282	0.284	0.9761	0.9752	0.8397
CSCD	13	7	1.788	2.314	0.6317	0.5478	0.0364
CSCSD	13	7	0.906	1.802	0.2995	0.1517	0.0004
TLCD	13	7	1.919	1.337	0.1771	0.2378	0.1184
RBUB	13	7	0.84	0.936	0.7326	0.6883	0.1783
LIOI	13	7	0.563	0.517	0.657	0.6238	0.4648
TTONB	13	7	15.547	26.782	0.0729	0.0154	0.0162
TTDSS	13	7	0.518	0.935	0.0691	0.0157	0.0338

(TDCD). See table 6.29. Banks that are Lagos-based (so to speak), seem to be more profitable than the other category of banks. The average return on assets (NITA) is 3.5% for the former and -0.5% for the latter. Relating these to those observed for classification variables BANK1, BANK2 and BANK3, it would appear that the majority of Lagos-based banks are resistant while the others are vulnerable. The average values of OEOI and OETA for both classes of banks reveals that Lagos-based banks are more efficient.

While profitability and managerial efficiency remained significant as observed from the corresponding ratios OITC and OERA respectively, liquidity, capital adequacy and risk also were significant in 1986 as can be observed from table 6.30. Lagos-based banks recorded an average cash and short-term funds to total assets ratio (CSTA), of 24.2% compared with outside Lagos-based banks that had 46.1% on the average. Consequently, there is sufficient reason to believe that Lagos-based banks were less liquid. Their capital position seemed worse than that of the other group of banks going by the average value of TCTA which was 3.7% for Lagos-based banks compared with 7.4% for banks with head-office outside Lagos. Banks with head office in Lagos reflect a lower CATA ratio than those in the other category. CATA averaged 45.3% for banks based in Lagos and 72.8% for those outside Lagos. This reveals that Lagos-based banks undertake essentially greater risk than those with head-office based outside Lagos. This development is consistent with the above observation that Lagos-based banks are less liquid.

Table 6.31 shows that profitability, asset quality and managerial efficiency still were the significant distinguishing factors for banks regarding head office location as at 1987. NITA and NITC were significant at 5% and 10% levels respectively. While the return on assets of Lagos-based banks averaged 4%, it averaged 0.6% for the other class of banks. Regarding asset quality, loan loss provision as a proportion of operating expenses (LLOE) averaged 90.7% for Lagos-based banks compared with 28% for outside Lagos-based banks. This still does confirm the higher level of risk associated with assets of Lagos-based banks. Expectedly, Lagos-based banks were more efficient in 1987 going by the average value of OEOI of 63.9% compared with

Table 6.29 Results of Univariate T-Test for HOL in 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Lagos	Outside	Lagos	Outside			
NITA	11	7	0.035	-0.005	0.0412	0.0173	0.5021
NITC	11	7	0.812	0.298	0.3054	0.2327	0.1628
OITA	11	7	0.092	0.075	0.0916	0.0591	0.6419
OITC	11	7	2.861	2.269	0.5732	0.5516	0.7005
NISS	11	7	0.031	0.004	0.8033	0.0784	0.5399
OISS	11	7	0.049	0.05	0.536	0.5234	0.9238
OINB	11	7	3.36	1.659	0.2049	0.2544	0.0799
OIRB	10	7	6.841	5.733	0.8048	0.7667	0.453
TLD	11	7	0.574	0.556	0.9052	0.8784	0.0061
CSTA	11	7	0.299	0.455	0.3689	0.2755	0.0339
GSTA	11	7	0.184	0.183	0.9919	0.992	0.7794
TCTA	11	7	0.04	0.062	0.3408	0.2202	0.0004
TLSF	11	7	15.11	10.435	0.4048	0.4723	0.0331
TCRA	11	7	0.059	0.192	0.3391	0.2055	0
TLCLL	10	7	5.334	6.532	0.544	0.4713	0.0129
TLTA	11	7	0.438	0.44	0.9471	0.9367	0.0308
LLTL	10	7	0.101	0.071	0.544	0.4958	0.1802
RATA	11	7	0.724	0.617	0.3659	0.2781	0.0566
CATA	11	7	0.45	0.685	0.2029	0.1639	0.6393
LLOE	10	7	0.836	0.429	0.3116	0.2949	0.9486
OEOI	11	7	0.626	1.21	0.1018	0.0336	0.0039
OETA	11	7	0.057	0.079	0.0792	0.0625	0.8673
OETC	11	7	2.048	1.971	0.9257	0.9337	0.1478
OERA	11	7	0.079	0.173	0.1303	0.0457	0.0003
OESS	11	7	0.035	0.462	0.4399	0.3944	0.4184
OENB	11	7	2.759	1.506	0.6839	0.7125	0.191
OERB	10	4	4.398	4.57	0.9102	0.9131	1
DVOI	11	7	0.019	0.008	0.2763	0.3237	0.1246
TDOD	11	7	2.392	0.862	0.0913	0.1021	0.2637
TDTD	11	7	0.379	0.385	0.948	0.942	0.2758
CSCD	11	7	2.509	1.308	0.7254	0.7181	0.9058
CSCSD	11	7	1.15	0.922	0.6169	0.6159	0.8614
TLCD	11	7	2.002	1.374	0.2019	0.1317	0.1493
RBUB	12	8	0.603	0.42	0.3421	0.3221	0.8637
LIOI	11	7	6.84	0.647	0.3488	0.4494	0
TTDNB	11	7	31.461	16.901	0.3357	0.4104	0.0179
TTDSS	11	7	0.587	0.522	0.7995	0.8067	0.5713

Table 6.30: Results of Univariate T-Test for HOL in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Lagos	Outside	Lagos	Outside			
NITA	12	8	0.029	0.006	0.2263	0.1711	0.2329
NITC	12	8	0.733	0.395	0.3514	0.3743	0.3219
OITA	12	8	0.089	0.081	0.3061	0.2178	0.0126
OITC	12	8	3.083	1.807	0.1093	0.1366	0.0782
NISS	12	8	0.051	0.016	0.3526	0.4264	0.0031
OISS	12	8	0.104	0.061	0.368	0.4295	0.0207
OINB	12	8	4.764	1.966	0.2313	0.3065	0.001
OIRB	10	5	6.978	5.816	0.7413	0.7137	0.5837
TLD	12	8	0.635	0.603	0.7926	0.7701	0.1977
CSTA	12	8	0.242	0.461	0.1359	0.0673	0.0118
GSTA	12	8	0.109	0.117	0.9085	0.9054	0.7907
TCTA	12	8	0.037	0.074	0.1481	0.0654	0.0001
TLSF	12	8	27.069	8.602	0.1546	0.2131	0.0048
TCRA	12	8	0.055	0.136	0.2101	0.1078	0
TLCLL	12	8	5.783	7.006	0.5372	0.4945	0.1552
TLTA	12	8	0.444	0.448	0.9686	0.9645	0.1196
LLTL	11	8	0.207	0.062	0.4137	0.3539	0.0653
RATA	12	8	0.734	0.656	0.4503	0.417	0.5025
CATA	11	7	0.453	0.728	0.1414	0.1043	0.6424
LLOE	11	8	0.9	0.427	0.2972	0.2702	0.6994
OEOI	12	8	0.683	1.091	0.269	0.1754	0.0039
OETA	12	8	0.061	0.074	0.3583	0.338	0.0001
OETC	12	8	2.35	1.412	0.2547	0.3233	0.0058
OERA	12	8	0.082	0.125	0.1467	0.0762	0.0001
OESS	12	8	0.053	0.045	0.6666	0.6896	0.222
OENB	12	8	2.295	1.46	0.2435	0.3069	0.0113
OERB	10	5	4.328	3.69	0.7168	0.7451	0.4474
OVOI	12	8	0.034	0.019	0.5652	0.6237	0.0049
TDCD	12	7	1.476	1.105	0.3717	0.369	0.8273
TDITD	12	7	0.347	0.363	0.7625	0.7982	0.0682
CSCD	12	7	1.593	2.024	0.6887	0.6332	0.0917
CSCSD	12	7	1.224	1.589	0.7211	0.672	0.1012
TLCD	12	7	2.609	1.852	0.2086	0.1987	0.8283
RBUB	12	8	0.59	0.482	0.5824	0.559	0.5685
LIOI	11	8	0.576	0.628	0.582	0.5461	0.2084
TTDNB	12	8	36.372	16.46	0.2332	0.3084	0.0010
TTOSS	12	8	0.797	0.508	0.4026	0.4623	0.0236

Table 6.31: Results of Univariate T-Test for HOL in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Lagos	Outside	Lagos	Outside			
NITA	12	8	0.04	0.006	0.0488	0.0424	0.0001
NITC	12	8	1.165	0.342	0.1009	0.075	0.7556
OITA	12	8	0.105	0.095	0.2012	0.2115	0.943
OITC	12	8	4.856	3.95	0.6744	0.6529	0.4814
NISS	12	8	0.102	0.011	0.2509	0.3356	0
OISS	12	8	0.167	0.079	0.3416	0.4223	0.0005
OINB	12	8	6.409	2.461	0.2274	0.3074	0.0001
OIRB	10	6	8.25	10.168	0.6947	0.6391	0.1151
TLD	12	8	0.541	0.584	0.6718	0.646	0.3767
CSTA	12	8	0.459	0.515	0.791	0.7871	0.9475
GSTA	12	8	0.098	0.094	0.9486	0.9444	0.3796
TCTA	12	8	0.035	0.046	0.4363	0.3957	0.3858
TLSF	12	8	20.536	17.854	0.815	0.8044	0.565
TCRA	12	8	0.057	0.073	0.4162	0.4038	1
TLCLL	11	8	5.192	9.461	0.2549	0.1684	0.0002
TLTA	12	8	0.397	0.396	0.9905	0.9895	0.2216
LLTL	11	8	0.132	0.054	0.2033	0.1453	0.0888
RATA	12	8	0.687	0.616	0.4678	0.4172	0.2124
CATA	12	7	0.493	0.595	0.5752	0.5239	0.2733
LLOE	11	8	0.907	0.28	0.1313	0.1071	0.8271
OEOI	12	8	0.685	0.753	0.5025	0.5194	0.4295
OETA	12	8	0.065	0.089	0.1661	0.1182	0.2996
OETC	12	8	3.691	3.608	0.9671	0.9662	0.8448
OERA	12	8	0.093	0.187	0.1564	0.0698	0
OESS	12	8	0.065	0.068	0.9084	0.9104	0.656
OENB	12	8	2.706	0.144	0.5413	0.5727	0.1851
OERB	12	6	5.045	8.721	0.331	0.2329	0.0923
DVOI	12	8	0.011	0.021	0.4529	0.3928	0.1233
TDCD	12	7	1.651	1.94	0.7903	0.7251	0.0002
TDTYD	12	7	0.387	0.624	0.4447	0.2984	0
CSCD	12	7	2.376	1.903	0.5667	0.5564	1
CSCSD	12	7	1.663	1.345	0.6338	0.6194	0.8147
TLCD	12	7	2.17	1.817	0.5126	0.4267	0.0617
RBUB	12	8	0.564	0.519	0.8158	0.8035	0.4811
LIOI	12	8	0.584	0.669	0.3109	0.2827	0.7111
TTDNB	12	8	38.506	16.806	0.1654	0.2281	0.0031
TTDSS	12	8	0.982	0.545	0.3172	0.3845	0.0097

Table 6.32: Results of Univariate T-Test for HOL in 1988

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Lagos	Outside	Lagos	Outside			
NITA	12	8	0.041	0.032	0.5111	0.5264	0.4579
NITC	12	8	0.914	0.693	0.4303	0.4433	0.499
OITA	12	8	0.12	0.125	0.8717	0.8454	0.0028
OITC	12	8	4.115	2.374	0.1996	0.2768	0.0001
NISS	12	8	0.068	0.036	0.3977	0.4706	0.0029
OISS	12	8	8.182	0.117	0.4756	0.5444	0.0027
OINB	12	8	5.886	3.554	0.3481	0.4213	0.0035
OIRB	12	7	17.924	11.018	0.4361	0.5273	0.01
TLD	12	8	0.499	0.476	0.8172	0.8137	0.9398
CSTA	12	8	0.322	0.582	0.3308	0.2278	0.0007
GSTA	12	8	0.109	0.103	0.9427	0.9402	0.6934
TCTA	12	8	0.047	0.057	0.5928	0.5427	0.1051
TLSF	12	8	17.532	7.138	0.1888	0.2642	0.0001
TCRA	12	8	0.073	0.149	0.2063	0.1154	0.0013
TLCLL	12	8	4.245	5.671	0.401	0.346	0.2051
TLTA	12	8	0.388	0.344	0.6418	0.612	0.339
LLTL	12	8	0.156	0.098	0.5163	0.4581	0.0984
RATA	12	8	0.699	0.479	0.0505	0.0202	0.167
CATA	12	8	0.52	0.63	0.482	0.4401	0.3226
LLOE	12	8	0.801	0.483	0.5037	0.4483	0.1325
OEOI	12	8	0.685	0.753	0.5025	0.5195	0.4295
OETA	12	8	0.078	0.093	0.5681	0.4885	0.0027
OETC	12	8	3.202	1.735	0.299	0.3852	0
OERA	12	8	0.114	0.223	0.1652	0.0744	0
OESS	12	8	0.113	0.082	0.5527	0.6125	0.0048
OENB	12	8	3.765	2.516	0.4051	0.4735	0.0067
OERB	12	7	11.297	7.61	0.4826	0.5671	0.0138
DVOI	12	8	0.023	0.02	0.84	0.8532	0.1731
TDOD	12	8	1.222	1.744	0.39	0.2833	0.0001
TDITD	12	8	0.357	0.434	0.202	0.1372	0.1018
CSCD	12	8	1.436	2.815	0.2703	0.1698	0.0007
CSCSD	12	7	0.957	1.52	0.2148	0.1636	0.4857
TLCD	12	8	1.59	1.935	0.5458	0.4673	0.006
RBUB	12	8	0.671	0.546	0.4322	0.3822	0.2481
LIOI	12	8	0.623	0.584	0.6701	0.6382	0.2515
TTDNB	12	8	31.643	21.751	0.3164	0.3596	0.103
TTDSS	12	8	0.939	0.714	0.5219	0.5657	0.0729

91.6% for other class of banks. Same trend is established from the values of OETA.

The return on asset (NITA) and risk (RATA) were significant at 5% level in 1988. Table 6.32 confirms this. In 1989, risk (RATA) remained significant at 5% while the ratios CATA and TTDNB were additionally significant at 15% and 10% levels. We can confirm this from the results in Table 6.33.

Over the study period, significant factors that distinguish Lagos-based from other banks are profitability and risk/asset quality. Managerial efficiency had been significant in the pre-SAP period as well as in the first year of SAP. Quite clearly, we find that Lagos-based banks are much more profitable than other banks just as they undertake higher risk.

Also comparing banks with technical partnership agreements with those without, we find from Tables 6.34 to 6.38 that over the study period the significant distinguishing factors are profitability, liquidity, managerial efficiency and bank structure/size. Specifically, the banks with technical partnership agreements seem to be more profitable than those without as measured by both the return on assets (NITA) as well as the return on capital (NITC). Operating income per staff (OISS) has also been higher for banks with technical partners.

Liquidity was observed significant over the period 1985 to 1987. Measured by the ratio of loans to deposits (TLD), banks with technical partners were less liquid than those without. On close examination of the classification of banks with and without technical partners we find that those without they are in most cases wholly state government owned. Their low profitability can thus be appreciated.

OEOI averaged 58.2% for banks with technical partnership agreements and 90.8% for other class of banks going by 1988 figures. The trend is similar from 1985 to 1987. This suggests that banks with technical partners are more efficient than those without. The trend was similar for DVOI. While banks with technical partners paid on the average 3.6% of their operating income as dividend the corresponding average was 0% in 1988. Both the deposit per staff as well as deposit per branch were observed to be higher for banks with technical partners compared with the other class of banks. Between 1985 and 1987, banks with technical partnership agreements were

also more liquid than those without. This can be observed from an investigation of the comparative average values of GSTA over the 1985 to 1987 period.

Table 6.33: Results of Univariate T-Test for HOL in 1989

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	Lagos	Outside	Lagos	Outside			
NITA	12	8	0.045	0.046	0.9733	0.9773	0.0055
NITC	12	8	1.887	0.514	0.1142	0.1761	0
OITA	12	8	0.156	0.194	0.4703	0.3797	0.0029
OITC	12	8	11.664	1.685	0.3006	0.3903	0
NISS	12	8	0.086	0.037	0.4175	0.4996	0
OISS	12	8	0.193	0.133	0.4724	0.5418	0.0024
OINB	12	8	5.236	3.494	0.2905	0.3632	0.0036
OIRB	12	8	14.414	9.086	0.3503	0.4246	0.0028
TLD	12	8	0.524	0.603	0.6705	0.62	0.0369
CSTA	12	8	0.344	0.511	0.2184	0.178	0.4888
GSTA	12	8	0.056	0.108	0.4543	0.3659	0.0054
TCTA	12	8	0.042	0.075	0.3236	0.3102	0.9803
TLSF	12	8	44.616	3.483	0.3041	0.3942	0
TCRA	12	8	0.084	0.312	0.176	0.0889	0.0006
TLCLL	12	8	3.909	3.885	0.9828	0.982	0.6539
TLTA	12	8	0.382	0.41	0.7898	0.76	0.0718
LLTL	12	8	0.178	0.157	0.81	0.788	0.1636
RATA	12	8	0.661	0.463	0.0826	0.0403	0.7296
CATA	12	8	0.554	0.738	0.1573	0.1276	0.7119
LLOE	12	8	0.602	0.672	0.8829	0.856	0.0002
OEOI	12	8	0.742	0.74	0.9878	0.9896	0.0093
OETA	12	8	0.111	0.148	0.472	0.4127	0.1189
OETC	12	8	9.777	1.172	0.3288	0.4186	0
OERA	12	8	0.17	0.619	0.1746	0.0784	0
OESS	12	8	0.107	0.096	0.7223	0.7404	0.26
OENB	12	8	3.218	2.486	0.2772	0.3227	0.079
OERB	12	8	8.408	6.526	0.4085	0.4479	0.137
DVOI	12	8	0.032	0.028	0.8626	0.8717	0.2731
TDCD	12	8	0.813	1.165	0.4617	0.3697	0.0024
TDTT	12	8	0.255	0.324	0.4347	0.3647	0.0615
CSCD	12	8	1.67	2.425	0.3532	0.372	0.3817
CSCSD	12	8	1.148	1.327	0.7475	0.775	0.0601
TLCD	12	8	1.569	1.935	0.5352	0.4519	0.0031
RBUB	12	8	0.878	0.868	0.9648	0.9651	0.7823
LIOI	12	8	0.572	0.51	0.5671	0.498	0.0177
TTONB	12	8	22.678	14.68	0.063	0.0889	0.023
TTDSS	12	8	0.727	0.57	0.3691	0.3847	0.4405

Table 6.34: Results of Univariate T-Test for TP in 1985

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	With TP	Without TP	With TP	Without TP			
NITA	10	8	0.041	-0.007	0.0068	0.0017	0.5823
NITC	10	8	1.13	-0.036	0.0039	0.0017	0.21
OITA	10	8	0.09	0.078	0.2376	0.2132	0.7589
OITC	10	8	2.659	2.596	0.9522	0.9489	0.2079
NISS	10	8	0.041	-0.003	0.0016	0.0009	0.008
OISS	10	8	0.091	0.023	0.0014	0.0009	0
OINB	10	8	4.193	0.83	0.0122	0.0133	0
OIRB	8	6	9.828	2.12	0.0092	0.0095	0.0006
TLD	10	8	0.468	0.691	0.0721	0.0389	0.0753
CSTA	10	8	0.333	0.393	0.6864	0.6702	0.4183
GSTA	10	8	0.275	0.069	0.0122	0.011	0.0094
TCTA	10	8	0.041	0.058	0.383	0.3182	0.0008
TLSF	10	8	9.396	18.161	0.2266	0.1599	0.0002
TCRA	10	8	0.064	0.169	0.3866	0.3147	0
TLCLL	10	7	5.177	6.756	0.4219	0.3395	0.0167
TLTA	10	8	0.349	0.545	0.0472	6.0238	0.0001
LLTL	10	7	0.091	0.085	0.3068	0.8999	0.4365
RATA	10	8	0.692	0.671	0.8434	0.8378	0.6514
CATA	10	8	0.483	0.616	0.4552	0.4318	0.5459
LLOE	10	7	0.72	0.595	0.7553	0.7525	0.9413
OEOI	10	8	0.556	1.226	0.0338	0.0106	0.0023
OETA	10	8	0.049	0.086	0.002	0.0004	0.8276
OETC	10	8	1.528	2.632	0.2712	0.2177	0.0446
OERA	10	8	0.08	0.161	0.1286	0.0799	0.0154
OESS	10	8	0.05	0.026	0.0515	0.0536	0.0318
OENB	10	8	2.007	0.954	0.0383	0.0443	0.0005
OERB	8	6	5.892	2.353	0.078	0.0993	0.0001
DVOI	10	8	0.025	0.002	0.0349	0.0401	0.0005
TDCD	10	8	1.621	0.654	0.0012	0.0006	0.0063
TDTTD	10	8	0.466	0.276	0.0272	0.0268	0.0221
CSCD	10	8	1.633	1.177	0.4008	0.3995	0.5835
CSCSD	10	8	1.319	0.739	0.1843	0.1815	0.3857
TLCD	10	8	1.773	1.739	0.9355	0.9347	0.9259
RBUB	12	8	0.49	0.59	0.6106	0.5941	0.7088
LIOI	10	8	0.559	9.272	0.3475	0.2732	0.0001
TTDNB	10	8	39.521	8.647	0.0513	0.063	0
TTDSS	10	8	0.816	0.244	0.0152	0.0162	0.0003

Table 6.35: Results of Univariate T-Test for TP in 1986

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	With TP	Without TP	With TP	Without TP			
NITA	12	8	0.037	-0.006	0.0145	0.0042	0.4862
NITC	12	8	0.949	0.069	0.0083	0.0126	0.0087
OITA	12	8	0.087	0.084	0.7885	0.761	0.1014
OITC	12	8	2.359	2.892	0.6265	0.5446	0
NISS	12	8	0.063	-0.002	0.0764	0.1298	0
OISS	12	8	0.128	0.029	0.0256	0.0507	0
OINB	12	8	5.46	0.923	0.0482	0.0887	0
OIRB	9	8	9.652	1.998	0.0023	0.0031	0.001
TLD	12	8	0.551	0.729	0.1333	0.0944	0.4364
CSTA	12	8	0.301	0.371	0.6161	0.5754	0.18781
GSTA	12	8	0.166	0.031	0.0173	0.0329	0.0002
TCTA	12	8	0.041	0.069	0.2748	0.1674	0
TLSF	12	8	9.741	19.595	0.2479	0.144	0
TCRA	12	8	0.064	0.122	0.367	0.2512	0
TLCLL	12	7	5.966	6.866	0.6708	0.6245	0.2049
TLTA	12	8	0.356	0.58	0.115	0.0032	0.5892
LLTL	12	7	0.078	0.103	0.6732	0.6131	0.0771
RATA	12	8	0.688	0.725	0.704	0.7065	0.7569
CATA	10	8	0.519	0.611	0.6085	0.5916	0.5464
LLOE	12	7	0.687	0.727	0.9307	0.9268	0.6888
OEOI	12	8	0.587	1.236	0.0735	0.024	0.004
OETA	12	8	0.05	0.09	0.002	0.0007	0.3915
OETC	12	8	1.409	2.823	0.221	0.1296	0.0021
OERA	12	8	0.073	0.138	0.028	0.0045	0.003
OESS	12	8	0.064	0.281	0.0272	0.0475	0.0012
OEMB	12	8	2.585	1.026	0.0252	0.0467	0.0001
OERB	9	6	5.348	2.267	0.0533	0.0844	0.0024
DVOI	12	8	0.045	0.002	0.0759	0.1293	0
TDCD	11	8	1.677	0.875	0.0279	0.0363	0.0085
TOTTD	11	8	0.379	0.316	0.2494	0.286	0.0459
CSCD	11	8	2.137	1.222	0.2668	0.2928	0.1337
CSCSD	11	8	1.846	0.689	0.1231	0.1578	0.0064
TLCD	11	8	2.518	2.072	0.4233	0.4452	0.2314
RBUB	12	8	0.476	0.653	0.3745	0.3341	0.4371
LLOI	11	8	0.563	0.645	0.3509	0.3446	0.799
TTDNB	12	8	41.223	9.184	0.051	0.0928	0
TTDSS	12	8	0.965	0.257	0.032	0.0606	0

Table 6.36: Results of Univariate T-Test for TP in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	With TP	Without TP	With TP	Without TP			
NITA	12	8	0.038	0.009	0.0599	0.1031	0
NITC	12	8	1.14	0.38	0.086	0.1029	0.1297
OITA	12	8	0.102	0.098	0.6129	0.6355	0
OITC	12	8	3.948	5.313	0.5566	0.4965	0.0594
NISS	12	8	0.106	0.004	0.1921	0.2756	0
OISS	12	8	0.195	0.037	0.0843	0.1419	0
OINB	12	8	7.184	1.297	0.0695	0.1207	0
OIRB	9	7	10.849	6.552	0.3257	0.2729	0.1442
TLD	12	8	0.468	0.693	0.0218	0.0082	0.5404
CSTA	12	8	0.369	0.649	0.2516	0.1603	0.0047
GSTA	12	8	0.14	0.031	0.0179	0.0319	0.0012
TCTA	12	8	0.035	0.046	0.4632	0.3857	0.0223
TLSF	12	8	12.656	29.675	0.1899	0.103	0.0019
TCRA	12	8	0.061	0.066	0.8194	0.8034	0.3181
TLCLL	12	7	5.099	10.23	0.2302	0.1019	0
TLTA	12	8	0.315	0.519	0.0134	0.0031	0.3327
LLTL	12	7	0.102	0.094	0.9105	0.8955	0.1392
RATA	12	8	0.643	0.682	0.6461	0.6572	0.5099
CATA	11	8	0.543	0.513	0.8602	0.8507	0.386
LLOE	12	7	0.7	0.546	0.72	0.7094	0.8224
OEOT	12	8	0.65	0.899	0.0491	0.0842	0.0003
OETA	12	8	0.065	0.089	0.0861	0.1193	0.0223
OETC	12	8	2.808	4.933	0.3403	0.2708	0.0907
OERA	12	8	0.121	0.145	0.6329	0.6616	0.1556
OESS	12	8	0.088	0.033	0.0088	0.0179	0
OENB	12	8	3.358	1.167	0.0094	0.0181	0.0003
OERB	9	7	7.063	5.601	0.6639	0.6343	0.1685
DVOI	12	8	0.025	0	0.0075	0.0166	0
TDCD	11	8	2.351	0.941	0.043	0.0646	0
TDTT	11	8	0.591	0.314	0.1556	0.2103	0
CSCD	11	8	2.19	2.218	0.9722	0.9712	0.70750
CSCSD	11	8	1.735	1.286	0.4653	0.4713	0.5546
TLCD	11	8	1.937	2.182	0.5922	0.5747	0.6505
RBUB	12	8	0.492	0.627	0.4749	0.4523	0.703
LTOI	12	8	0.598	0.648	0.5155	0.5254	0.5687
TTDNB	12	8	43.242	9.702	0.0277	0.0546	0
TTDSS	12	8	1.155	0.286	0.0392	0.0739	0

Table 6.37: Results of Univariate T-Test for TP in 1987

Variable	No. of Observation		Mean		Unequal Prob > T	Equal Prob > T	Prob > F'
	With TP	Without TP	With TP	Without TP			
NITA	12	8	0.053	0.015	0.0127	0.0082	0.5035
NITC	12	8	1.207	0.199	0.0008	0.0013	0.0006
OITA	12	8	0.123	0.121	0.9539	0.9443	0.002
OITC	12	8	2.744	4.431	0.4068	0.2927	0
NISS	12	8	0.087	0.008	0.0362	0.0684	0
OISS	12	8	0.219	0.062	0.0781	0.1308	0
OINB	12	8	6.849	2.109	0.0519	0.0917	0
OIRB	12	7	21.564	40779	0.0495	0.1128	0
TLD	12	8	0.456	0.539	0.4443	0.3984	0.2949
CSTA	12	8	0.3	0.616	0.2355	0.1395	0.001
GSTA	12	8	0.164	0.02	0.0225	0.0412	0.004
TCTA	12	8	0.049	0.055	0.7811	0.7405	0.0087
TLSF	12	8	8.064	21.341	0.2585	0.149	0
TCRA	12	8	0.074	0.149	0.2238	0.1196	0
TLCLL	12	8	4.178	5.771	0.3735	0.291	0.0242
TLTA	12	8	0.338	0.419	0.4019	0.3443	0.1763
LLTL	12	8	0.106	0.172	0.4765	0.4043	0.0373
RATA	12	8	0.678	0.51	0.143	0.0852	0.0993
CATA	12	8	0.572	0.552	0.9032	0.892	0.1715
LLOE	12	8	0.659	0.696	0.9363	0.9320	0.2837

Table 6.38: Summary of Significant Variables for Other Classifications
Based on the T-Test (1985-1989)

Variable	1985	1986	1987	1988	1989	Common Variables
ROWN	OISS*,OINB**	OISS*,OINB***	OINB*,OIRB*, TLD*	OISS**,OINB**	OISS***,OINB**	OINB,OISS
	OIRB*,TLD*	TLD**,GSTA***	TLTA*,OERA**	OIRB**,TLCLL**	TLTA**,LLTL*	TLDCI (1985-81)
	GSTA*,TTDNB**	TLTA***,OESS*	TTDNB**	RATA**	LLOE**,OERA***	TLTACI(1988 -89)
	TTDSS*	OENB*,OERB*	TTDSS**	OESS**,OENB**	OESS***,OENB*	OESS91986-8 9)
		TDOD**,TTDNB***		OERB**	OERB***,DVOI*	TTDNB,TTDSS
		TTDSS**		TTDNB*	TTDNB*,TTDSS*	
				TTDSS*		
HOL	NITA*,MISS**	OITC**,CSTA***	NITA*,NITC**	NITA*	RATA*	
	OEOI**,OETA**	TCTA***,CATA**	LLOE**, OEOI**	RATA***	CATA*	
	TDOD**	OERA***	OETA*		TTDNB	
TP	NITA*,NITC*	NITA*,NITC*,MISS**	NITA**, OISS**	NITA*,NITC*		NITA,NITC,
	MISS*,OISS*	OISS*,OINB*,OIRB*	OINB**	MISS*,OISS**		OISS,TLD (85-87)
	OINB*,OIRB*	TLD*,GSTA*,TLTA*	TLD*,GSTA*	OINB**,OIRB**		OEOI,OESS, DVOI,
	TLD*,GSTA*	OEOI**,OETA*	TLTA*	GSTA*,RATA**		TTDNB,TTDSS
	OENB*,OERB**	OERA*,OESS*	OEOI*,OESS*	OEOI*,OERA**		GSTA.
	DVOI*,TDOD*,OESS*, OEOI*,OETA*,OERA*	OENB*,OERB**, DVOI**,TDOD*	OENB*,DVOI*	OESS***, OENB***		
	TDOTD*,TTDNB*	CSCSD**	TDOD*,TTDNB*	DVOI*		
	TTDSS*	TTDNB**,TTDSS*	TTDSS*	TTDNB*,TTDSS*		

Notes: * implies variable is significant at 5% level
 ** implies variable is significant at 10% level
 *** implies variable is significant at 15% level.

CHAPTER SEVEN

DISCRIMINANT AND LOGIT ANALYSES

7.1 Introduction

Having discussed the responses from the survey in chapter five, we examined in chapter six the significance of the various categories of bank performance factors by testing the individual significance of the various ratios under each category of factors for each of the period covering 1985 to 1989. In this chapter, we conduct more rigorous analyses to further confirm the individual and, perhaps, more importantly the combined significance of some groups of factors. This, as was earlier explained, stems from the dictates of intuition as well as banking theory and the conclusions of earlier research, that bank failure or dismal performance is caused by a combination of factors rather than a single factor.

In the section that follows we discuss the features of the discriminant analysis module of the SAS Software, being the statistical package which is employed for our analysis and is further expected to aid an understanding of the results of our analysis. The results of both the discriminant and logit analyses is discussed and an assessment of the ability of the models also conducted.

7.2 The SAS Software for Discriminant Analysis

Discriminant analysis involves the computation of various discriminant functions for classifying observations into two or more groups on the basis of one or more quantitative variables. For a set of observations containing one or more quantitative variables and a classification variable defining groups of observations, the discriminant analysis attempts to develop a discriminant criterion from this data set to classify each observation into one of the groups.

Once the discriminant functions have been derived, they provide for the pursuant of the two research objectives for which the technique was developed, viz: analysis and classification. The analysis aspects provides tools such as statistical tests

for assessing the success with which the discriminating variables actually discriminate between the groups defined by the response/dependent variable. Next comes the use of the technique for classification. Once a set of variables is found which provides satisfactory discrimination for cases with known group membership, a set of classification functions are derived which permit the classification of new cases with unknown membership. It is in this sense that the technique may be said to be 'predictive' since it attempts to classify the new case into one of the defined groups based on the information on discriminatory variables.

For our purpose we desire to determine the important quantitative variables that can be used to derive a discriminant function to classify our sample banks into vulnerable and resistant categories of bank performance. Given that we are considering 37 financial ratios in addition to total deposits which is a measure of bank size, and other relevant indicators such as ownership (ROWN), Head-office location (HOL) and existence or non-existence of technical partners (TP), the selection of the best set of discriminatory/explanatory variables would be a difficult task. This is often the case in research, where the researcher is faced with the situation in which there are more discriminating variables than necessary to achieve satisfactory discrimination. To alleviate this choice/selection problem, the stepwise, forward and backward methods have been developed.

The **SAS software for personal computers version 6.04** which was adopted for conducting the T-test in both sections 6.3 and 6.4 also provides procedures for selecting, based on discriminant analysis, a set of variables from a larger set of variables, that are capable of classifying a set of observations into two or more categories. The **PROC STEPDISC** is one such procedure that we found highly suitable for our analysis. The **STEPDISC** procedure performs a stepwise discriminant analysis by forward selection, backward elimination, or stepwise selection of quantitative variables that can be useful for discriminating among several variables (Weck, 1980; SAS/STAT, 1990). Each of these cases involves a step-by-step evaluation of each variable in the variable set for entry into or exit from the list of variables that best explain the nature of the dependent variable. Hence, while some

variables would be selected, some others may be dropped or excluded.

In each of the instances, variables are chosen to enter or leave the model according to one of two criteria:¹

- (a) the significance level of an F-test based on an analysis of covariance, where variables already chosen act as covariates and the variable under consideration is the dependent variable; or
- (b) the squared partial correlation for predicting the variable under consideration from the classification variable, controlling for the effects of the variables already selected for the model.

Notable differences exist between these criteria. On one hand, the significance level and the squared partial correlation criteria select variables in the same order, although they may select different number of variables. On the other hand, increasing the sample size tends to increase the number of variables selected when using the significance level criteria but has little effect on the number selected using squared partial correlation. Costanza and Afifi (1979) using monte carlo studies conclude that the use of a moderate significance level, in the range of 10% to 25%, often performs better than the use of a much larger or a much smaller significance level. The threshold significance level of 15% which is also the default in the SAS software is employed for our analysis. The 15% level is informed by the conclusions of Costanza and Afifi (1979).

As previously indicated, a stepwise, forward and backward discriminant analysis can be conducted when an attempt is being made to select from within a larger set of variables, the combination that best explain a dependent variable. The forward selection procedure begins with no variables in the model. At each step, of all candidate variables, the variable is entered that contributes most to the discriminatory power of the model as measured by the Wilks' Lambda (Λ), the likelihood ratio criterion and also satisfies the entry criterion. The entry criterion is

¹ See Volume 2 of the *SAS/STAT User's Guide*.

that the variable must be found significant based on the F-test (explained above) and the threshold significance level. At the step where none of the unselected variables is found to meet the entry criterion, the process stops (SAS/STAT, 1990, p. 1494). The selected variables then represents the best combination for distinguishing the dependent variable.

The backward elimination begins unlike the forward selection, with all variables in the model. That is, all variables are assumed to satisfy the entry criterion. At each step the variable which contributes least to the discriminatory power of the model as measured also by Wilks' lambda is removed. The procedure continues until when all remaining variables meet the criterion to stay in the model. At this point, the backward elimination process stops. The 'staying' criterion is similar to the 'entry' criterion in the forward procedure.

Stepwise selection begins like forward selection with no variables in the model. First, the single best-discriminating variable according to Wilks Lambda is selected. A second variable is next selected, which represent the variable not included yet in the model but with the ability to best improve the discriminatory power of the model in combination with the first variable. At each step when the model is examined, if the variable in the model that contributes least to (or reduces) the discriminatory power of the model when combined with already selected variables (as measured by Wilks' lambda) fails to meet the criterion to stay, then the variable is removed. Otherwise, the variable not in the model that contributes most to the discriminatory power of the model and meets the entry criterion is entered. When all variables in the model meet the criterion to stay and none of the other not in the model variables meets the criterion to enter, the stepwise selection process stops.

In each of these procedures, in the selection of variables for entry, only one variable can be entered into the model at each step. One limitation of these processes is that, at each step they do not take into account the relationship between variables that have not yet been selected. As a consequence, some important variables could be excluded in the process. The stepwise procedure can be said to be more robust since it involves both the Forward and Backward criteria in addition to

the Wilk's Lambda for assessing the discriminating power of variables within and outside the model at every step. To this extent the resulting model would tend to be better specified while that of the other procedures would almost invariably be overspecified. The square partial correlation of the resulting model based on either the forward or backward selection procedures, would be exaggerated due to the relatively longer list of selected variables compared with the stepwise procedure.

The **STEPMISC** procedure prints, for each of the selection methods, summary statistics associated with the variable chosen at each step, including the final step when the model is compiled or fully identified. Those we find relevant include; the step number or rank of variable, number of variables in the model, partial R^2 , **Prob > F** which is the probability level for the F-statistic for entering the variable, the *average squared canonical correlation* (ASCC) and **Pr > ASCC** based on the F-approximation.

7.3 A Discriminant Analysis of Commercial Bank Performance in Nigeria

Tables 7.1 to 7.5 present the results of both stepwise and forward discriminant analysis for the bank performance classification variables BANK1, BANK2 and BANK3 as well as the other classifications such as Ownership (ROWN), Head-Office Location (HOL) and Technical Partnership (TP) from 1985 to 1989. We first concentrate on the bank performance based classification.

Table 7.1 reveals that existence or non existence of technical partnership agreements (TP), cost structure (TDTTD), liability match (TDCD), branch structure (TTDNB) as well as profitability (OISS) are chosen as the best set of variables, out of 35 variables, that discriminate between vulnerable and resistant banks based on the stepwise selection method. Going by the R^2 value, technical partnership (TP) explains 80% of the variation in bank performance. This is followed by TDTTD or cost structure which explains 45.6% of the variation and hence the ranking of cost structure as the second most important factor. The combination of selected variables exhibit an ASCC of 0.95 which is very impressive. We observe from table 6.23 that the set of significant variables were among the set of financial variables found

Table 7.1: Results of Multivariate Discriminant Analysis for Different Performance Criteria in 1985

EQ.	Class	Selected Variables	Rank	R ²	Pr > F	ASCC	Pr > ASCC	No. of Variables	Selection Method	Comment
1	BANK1	TP	1	0.8000	0.0001	0.8000	0.0001	35	Stepwise	* Technical Partnership
		TOTTD	2	0.4564	0.0029	0.8912	0.0001			* Cost Structure
		TDCD	3	0.2185	0.0679	0.9150	0.0001			* Liability Match
		TTDNB	4	0.2063	0.0890	0.9325	0.0001			* Branch Structure
		OISS	5	0.2259	0.0859	0.9478	0.0001			* Profitability
2	BANK2	TP	1	0.439	0.0027	0.4389	0.0027	35	Stepwise	* Technical Partnership
		TOTTD	2	0.2523	0.0399	0.5805	0.0015			* Cost Structure
3	BANK3	OEOI	1	0.4471	0.0024	0.4471	0.0024	35	Stepwise	* Managerial Efficiency
		TLSF	2	0.317	0.0186	0.6224	0.0007			* Capital Adequacy
4	ROWN	OESS	1	0.7309	0.0001	0.7309	0.0001	34	Stepwise	* Managerial Efficiency
		TTDNB	2	0.2274	0.0529	0.7921	0.0001			* Branch Structure
		TTD	3	0.2769	0.0363	0.8496	0.0001			* Bank Size
		CATA	4	0.1798	0.1152	0.8767	0.0001			* Asset Quality & Risk
5	HOL	OEOI	1	0.2524	0.0336	0.2524	0.0336	34	Stepwise	* Managerial Efficiency
		TLCD	2	0.1976	0.0738	0.4001	0.0216			* Liability Match
		TTD	3	0.1956	0.0863	0.5174	0.0145			* Bank Size
6	BANK1	NISS	1	0.5729	0.0003	0.5728	0.0003	32	Forward	* Bank Size
		TTD	2	0.5014	0.0015	0.7870	0.0001			* Branch Structure
		TTDNB	3	0.3783	0.0112	0.8676	0.0001			* Liability Match
		CSCSD	4	0.3536	0.0194	0.9144	0.0001			* Capital Adequacy
		TCRA	5	0.2191	0.0914	0.9332	0.0001			* Asset Quality & Risk
		CATA	6	0.252	0.0804	0.95	0.0001			* Managerial Efficiency
		DVOI	7	0.2637	0.0877	0.9632	0.0001			* Profitability
		NITC	8	0.2359	0.1299	0.9719	0.0001			
		RBUB	9	0.3921	0.0528	0.9829	0.0001			
7	BANK2	NITC	1	0.4323	0.0030	0.4323	0.0030	32	Forward	* Profitability
		OETC	2	0.1949	0.0760	0.543	0.0028			* Managerial Efficiency
7	BANK2	TTD	3	0.1754	0.1064	0.6231	0.0028			* Bank Size
8	TP	TTD	1	0.3752	0.0089	0.3752	0.0001	33	Stepwise	* Bank Size
		NITC	2	0.4172	0.0069	0.8299	0.0001			* Profitability
		CSCSD	3	0.2369	0.0658	0.8702	0.0001			* Liability Match
		TOTTD	4	0.1878	0.1216	0.8946	0.0001			
		NISS	5	0.1982	0.1106	0.9121	0.0001			

significant by the univariate test in distinguishing between vulnerable and resistant banks according to BANK1.

For BANK2 classification of bank performance, technical partnership and cost structure were the combination of variables selected as best for discriminating between the categories of banks based on the stepwise selection. Both the partial R^2 reduced in this case and so also is the maximum ASCC which is 0.58.

A different set of financial variables were found the best combination for BANK3 in the same year and based on the same selection method. In this case we have managerial efficiency (OEOI) and capital adequacy (TLSF). Associated with this combination of variables is an ASCC of 0.62. The ratio OEOI was observed to be significant for BANK3 in 1985 by the univariate T-test (Table 6.23). In each of these first three discriminant analysis, it would seem that the distinguishing factors vary with the performance criteria. The stepwise analysis finds TP and TDDTD, in that order, to be significant when the performance criteria is BANK1 or BANK2. A completely different set of variables was found significant for BANK3.

A discriminant analysis based on all the financial variables except HOL, ROWN and TP, which were initially adopted for distinguishing bank performance according to the different criteria, BANK1, BANK2, and BANK3 was conducted again. This analysis depended on the forward selection procedure. Dropping these qualitative (choice) variables was designed to reveal the effect of trying to capture the major performance determinants from only the financial ratios. From this and similar analysis, it is expected that the significance of the identified (and peculiar) qualitative factors for distinguishing bank performance would be revealed. With this second set of discriminant analysis, we have equally used a different selection method - the forward selection method, to observe whether any major selection differences will occur especially between such results as in BANK1 and BANK2 which revealed a subset of common significant ratios/factors.

For BANK1, also shown in Table 7.1, the combination of financial variables selected included bank size, branch structure, liability match, capital adequacy, asset quality/risk and managerial efficiency. The combination of ratios recorded an ASCC

of 0.982 which is higher than the 0.94 recorded for the stepwise selection. While only five (5) variables were selected based on the stepwise method, nine (9) were selected when TP was removed and the forward selection method was used. This development can be appreciated by considering the combination of variables selected by the stepwise discriminant analysis as being capable of classifying the banks by technical partnership factor.

From the same Table 7.1, we observe that the new variables selected include TTD (total deposits), NITC, CSCSD, TDTTD and NISS. Prior to the removal of TP (technical partnership), from the list of candidate financial variables, TDTTD had been chosen as one of the key variables for discriminating between vulnerable and resistant banks as defined by BANK1. When TP was dropped, in its place the variables TTD, NITC, CSCSD and NISS were added to the list of selected variables. The same set of variables were found to be the significant factors which distinguished banks by technical partnership (TP), as revealed from the stepwise discriminant analysis. In effect, the factors that characterise banks according to TP, also play the role of TP if and when it is found a significant discriminatory variable as in the above case.

When the forward selection procedure was adopted for BANK2, managerial efficiency remained a significant discriminating factor though the ratio selected was OETC rather than OEOL. Profitability and bank size also were among the combination of factors from the selection of NITC and TTD respectively. The maximum ASCC of 0.62 is higher for the forward selection-based model than the model on stepwise selection. Indeed, the increase in the ASCC for the forward selection-based models ordinarily suggest that they are better models. With forward selection the combination of variables remained the same for classification variables, BANK3, ROWN and HOL. These results are not reproduced in the table for precisely this reason. The results would reveal that the same models, when subjected to forward selection MDA, would tend to include more variables and exhibit (possibly as a result) higher ASCC than when subjected to stepwise MDA. The higher ASCC may in fact be explained only by an increase in the number of selected variables rather

than a significant increase in the significance of the resulting model. Perhaps, which of these causes that would explain the development could have been isolated if a correlation analysis had been conducted to assess the degree of correlation between the financial variables. This represents a shortcoming of our analysis and is revealed from table 7.1 to 7.5 as various combinations in the tables differ.

In 1986, for BANK1 classification, table 7.2 shows the combination of selected variables as belonging to the class of technical partnership, managerial efficiency and branch structure factors. In addition to technical partnership with a partial R^2 of 66.7%, OESS, OENB and NITC are the other variables selected which recorded partial R^2 of 36.2%, 58.7% and 15.3% respectively. These variables yield a 0.9255 value of ASCC and are individually significant in the model. For this analysis only 28 variables were utilized due to at least one missing value among the data points for the individual ratios that were deleted. In effect, about thirteen (13) variables have been dropped to enable the conduct of this analysis. This development reveals the fluctuation in the quality of information obtained even from the use of the questionnaire approach. The changes in the number of candidate variables from year to year need also be taken into consideration in attempting to explain the results of the analysis and also compare results from one year to another. This limitation imposed by the quality of the data constitutes another major shortcoming of our analysis.

The variables selected for explaining BANK1 performance classification were also retained for BANK2 except for NITC which was dropped and replaced with RBUB and OETC. Hence while technical partnership and managerial efficiency were retained as significant factors, branch structure (RBUB) was added. Again under stepwise MDA, a set of similar variables are found significant for distinguishing bank performance going by the performance criteria expressed by BANK1 and BANK2. This does not happen for BANK3, though in this case it shares a common factor, TP, with the other performance criteria. These developments would suggest that greater distinction exist between BANK3 and each of BANK1 and BANK2 criteria than exist between BANK1 and BANK2. It is noteworthy that the BANK3

Table 7.2: Results of Multivariate Discriminant Analysis for Different Performance Criteria in 1986

Eq.	Class	Variable	Rank	R ²	Pr > F	ASCC	Pr > ASCC	Var. No.	Method	Comment
1	BANK1	TP	1	0.6667	0.0001	0.6667	0.0001	28	Stepwise	* Technical
		OESS	2	0.362	0.0064	0.7873	0.0001			* Management
		OENB	3	0.5869	0.0002	0.9121	0.0001			* Profitability
		NITC	4	0.1525	0.1212	0.9255	0.0001			
2	BANK2	TP	1	0.2757	0.021	0.2757	0.0002	28	Stepwise	* Technical
		OESS	2	0.1662	0.0931	0.6983	0.0002			* Management
		OENB	3	0.3359	0.0147	0.7979	0.0001			* Branch
		RBUB	4	0.1751	0.0946	0.8178	0.0001			
		OETC	5	0.1156	0.1306	0.8461	0.0001			
3	BANK3	NITC	1	0.5	0.0005	0.4999	0.0005	28	Stepwise	* Profitability
		TP	2	0.2536	0.0279	0.6268	0.0002			* Technical
4	ROWN	OESS	1	0.7362	0.0001	0.7362	0.0001	27	Stepwise	* Management
		TTD	2	0.2535	0.028	8031	0.0001			* Bank Size
5	HOL	TP	1	0.1406	0.1033	0.1406	0.1033	27	Stepwise	* Technical
		TLSF	2	0.2298	0.0378	0.338	0.03			* Capital
6	BANK2	NITC	1	0.5004	0.0005	0.5004	0.0005	28	Forward	* Variables NITC, RATA and TLSF added; OETC dropped.
		TP	2	0.2757	0.021	0.6381	0.0002			
		OESS	3	0.1662	0.0931	0.6982	0.0002			
		OENB	4	0.3359	0.0147	0.7997	6.0001			
		RBUB	5	0.166	0.1172	0.8329	6.0001			
		RATA	6	0.2034	0.0916	0.8669	6.0001			
		TLSF	7	0.2864	0.0486	0.905	6.0001			
7	TP	NITC	1	0.2989	0.126	0.2989	0.0126	27	Forward	* Ownership
		ROWN6	2	0.3442	0.0083	0.5402	0.0014			* Profitability
		NISS	3	0.1579	0.1025	0.6128	0.0014			* Management
		DVOI	4	0.21	0.0643	0.6941	0.0009			* Bank Size
		OENB	5	0.3299	0.0200	0.795	0.0002			* Head-Office
		TTD	6	0.2434	0.0616	0.8449	0.0001			* Branch Structure
		OINB	7	0.4403	0.0097	0.9131	0.0001			
		TTDNB	8	0.3369	0.0375	0.9424	0.0001			
		HOL	9	0.4555	0.016	0.9687	0.0001			
		OETC	10	0.4135	0.0328	0.9817	0.0001			

performance classification is the most liberal of the three criteria.

For BANK3, the combination of selected variables include NITC and TP, highlighting yet again the importance of profitability and technical partnership. For all classifications technical partnership was found to be a significant discriminatory factor of bank performance. The discriminant analysis conducted to identify the combination of variables that distinguish banks with respect to the existence or non-existence of technical partnership agreements (equation 7 in table 7.2) indicated the significance of bank ownership, profitability, managerial efficiency, bank size, head-office location and branch structure. Profitability is indicated by the selection of NITC, NISS and OINB while managerial efficiency, by the selection of DVOI, OENB and OETC. All the selected ratios in this combination of variables had been shown to have significantly different means for banks with technical partners and those without (Table 6.38). Also, if TP was dropped in the analysis relating to BANK1, BANK2, and BANK3 classifications, it seems likely that it will be accounted for by all or a combination of the variables selected as best in discriminating banks according to TP.

When the forward selection procedure was adopted this time with TP, ROWN and HOL still retained as part of candidate variables to be selected, the result of the discriminant analysis remained the same for all classification variables except BANK2 (equation 6). The new combination of variables included according to their previous ranks, all but the variable OETC which was replaced with RATA and TLSF, to suggest the importance of risk/asset quality and capital adequacy. This new set of variables has an ASCC value of 0.91 compared with 0.84 associated with the previous set of variables. This difference may simply have been accounted for by the longer list of variables relative to other models. The resultant longer list of variables for one model and the retention of the same list for other models tends to support the tendency for the forward selection analysis to include more variables in the model.

It would seem, therefore, from the results of our analysis that the most significant factors that discriminate between vulnerable and resistant banks are technical partnership in addition to managerial efficiency and profitability.

Table 7.3: Results of Discriminant Analysis for Different Performance Criteria in 1987

EQ.	Class	Selected Variables	Rank	R ²	Pr > F	ASCC	Pr > ASCC	Number of Variables	Selection Method	Comment
1	BANK1	OEOI	1	0.6016	0.0002	0.6016	0.0002	38	Stepwise	* Managerial
		RATA	2	0.2442	0.4470	0.6981	0.0001			* Asset Quality &
		ROWN	3	0.3018	0.0275	0.7892	0.0001			* Ownership
		TTDNB	4	0.6571	0.0002	0.9277	0.0001			* Branch Structure
		RBUB	5	0.5072	0.0043	0.9644	0.0001			* Technical
		OISS	6	0.2058	0.1195	0.9717	0.0001			* Revenue Source
		TP	7	0.2767	0.0789	0.9795	0.0001			* Profitability
		LIOI	8	0.2339	0.1318	0.9843	0.9843			
		NITC	9	0.3125	0.0929	0.9892	0.0001			
		LLOE	10	0.366	0.0843	0.9931	0.0001			
2	BANK2	OEOI	1	0.4619	0.0019	0.4619	0.0019	32	Stepwise	* Managerial
		HOL	2	0.2567	0.0366	0.6016	0.011			* Head-Office
		TLCLL	3	0.4973	0.0023	0.7998	0.0001			* Capital Adequacy
		RBUB	4	0.2381	0.065	0.8474	0.0001			* Branch Structure
		OITC	5	0.2336	0.08	0.0831				* Profitability
3	BANK3	TLCLL	1	0.4592	0.002	0.4592	0.002	38	Stepwise	* Capital Adequacy
		TLSF	2	0.2794	0.0291	0.6103	0.0009			* Head-Office
		NITC	3	0.1767	0.105	0.6792	0.0009			* Managerial
		HOL	4	0.2987	0.0431	0.8481	0.0003			* Liability Match
		CSCD	5	0.1957	0.1447	0.8777	0.0002			
		DVOI	6	0.2002	0.1482	0.0902	0.003			
		TTDSS	7	0.1373	0.262	0.9235	0.0003			
4	ROWN	OESS	1	0.7412	0.0001	0.7412	0.0001	37	Stepwise	* Managerial
		TTD	2	0.1675	0.1155	0.8458	0.0001			* Bank Size
		TDTTD	3	0.2739	0.0453	0.8881	0.0001			* Cost Structure
		OITC	4	0.2423	0.0738	0.1375	0.0001			* Capital Adequacy
4	ROWN	TLSF	5	0.2924	0.0564	0.9558	0.0001			
5	HOL	TP	1	0.2835	0.0229	0.2835	0.0229	37	Stepwise	* Technical
		TDTTD	1	0.2444	0.0437	0.4586	0.01			* Cost Structure
		TLD	1	0.1749	0.107	0.5532	0.0087			* Liquidity
6	BANK2	TTDNB	4	0.3248	0.0266	0.9235	0.0003	37	Forward	* Variable added
7	ROWN	DVOI	2	0.2842	0.0275	0.9578	0.0001	37	Forward	* Variable added
8	TP	OEOI	1	0.4572	0.0021	0.4572	0.0021	37	Forward	* Managerial
		ROWN	2	0.3682	0.0098	0.657	0.0003			* Ownership
		NISS	3	0.3236	0.0215	0.7681	0.0001			* Profitability
		HOL	4	0.3386	0.0229	0.849	0.0001			* Head-office
		TLD	5	0.2115	0.0981	0.879	0.0001			* Liquidity
		RATA	6	0.4317	0.0147	0.9381	0.0001			* Risk
		OENB	7	0.2743	0.0805	0.9501	0.0001			
		DVOI	8	0.2482	0.1189	0.9625	0.0001			

Based on the classification variable BANK1, in 1987, a combination of managerial efficiency, asset quality, risk, ownership, branch structure, technical partnership and revenue sources ratios recorded an ASCC value of 0.99 as table 7.3 reveals. Both the ratios OEOI (managerial efficiency) and TTDNB (branch structure) with partial R^2 of 60.2% and 65.7% respectively were among the highly correlated variables with BANK1. For this stepwise analysis, 38 variables were considered (Table 7.3), being one of the periods with almost complete and good quality data.

In the stepwise analysis relating to BANK2, also in 1987 and as displayed in table 7.3, managerial efficiency, head-office location, capital adequacy, branch structure and profitability are significant distinguishing factors each being individually significant in the model. These are represented by the variable OEOI, HOL, TLCLL, RBUB and OITC with partial R^2 of 46.2%, 25.7%, 49.7%, 23.8% and 23.4% respectively. The average squared canonical correlation is 0.88 which indicates a good model. Among the selected variables OEOI and TLCLL had been confirmed by the univariate test as being significant factors which distinguish, according to BANK2 classification variable, resistant from vulnerable banks.

Capital adequacy, head-office location, managerial efficiency and match of liability are significant factors for discriminating between vulnerable and resistant banks according to classification variable BANK3. Capital adequacy, specifically TLCLL, represents the most significant ratio based on its partial R^2 of 45.9% and the level of significance (**Prob > F**) which is 0.2%. The ratio TLSF was chosen as an additionally significant capital ratio. In related studies, there has been a tendency to retain one ratio among a set which measure the same performance characteristic, say capital adequacy, as the significant ratio. Two or three ratios within a broad group have seldom been retained in a predictive model. The inclusion of both TLSF and TLCLL, both of which are capital ratios, suggests that the combination has been found to distinguish vulnerable from resistant banks according to the criteria expressed in BANK3. They jointly explain 61% of the variability in the BANK3 performance distinction. The peculiarity of our circumstance, wherein two ratios

within the same category are included in a model, would seem to convey that while they are different measures of the same performance characteristic, they differ in their efficacy.

When forward selection was adopted all selected combination of significant financial variables remained the same as with the stepwise selection except for the list of variables associated with BANK2. The variable TTDNB was added to the list and ranked 4th, higher than RBUB and OITC, which were now ranked 5th and 6th. The value of ASCC consequently increased from 0.88 to 0.92. From table 7.3, for convenience and due to space limitation, only the newly added variables are shown against variants of the main models.

Table 7.4 shows the results for 1988. The stepwise discriminant analysis for BANK1 selected as the group of discriminatory factors, managerial efficiency revenue sources, profitability, branch structure, liquidity, capital adequacy and risk. Asset quality is not chosen. Managerial efficiency is represented by OETA, revenue sources by LIOI, profitability by OINB and NITC, branch structure by RBUB, and capital adequacy by TCRA. Liquidity is represented by CSTA while other variables include CATA and TTDSS. Risk is represented by CATA. Of these factors, liquidity reflects the highest partial R^2 of 60.6% though it ranks 7th among the significant variables. For this model, maximum ASCC is 0.987.

All factors were found to play some significant role in discriminating between vulnerable and resistant banks according to the stepwise discriminant analysis based on BANK2 classification. We have OEOI (managerial efficiency), ROWN (ownership), LLOE (managerial efficiency), CSTA (liquidity), TP (technical partnership), TLCLL (capital adequacy), TDTTD (bank cost structure), OETC (managerial efficiency), RATA (risk/asset quality), HOL (head-office location), TTDNB (branch structure) and LIOI (revenue sources). OEOI has the highest partial R^2 of 56.0% followed by RATA and TTDNB with 44.75% and 44.57% respectively. The maximum ASCC of 0.9995 has been the highest of the models identified thus far.

Technical partnership, managerial efficiency, risk, liquidity and capital

Table 7.4: Results of Discriminant Analysis for Different Performance Criteria in 1988

EQ.	Class	Variable	Rank	R ²	Pr > F	ASCC	Pr > ASCC	Number of Variables	Selection Method	Comment
1	BANK1	OETA	1	0.2328	0.0426	0.7663	0.0001	38	Stepwise	* Managerial Efficiency
		LIOI	2	0.1476	0.1279	0.8008	0.0001			* Revenue Sources
		OINB	3	0.2782	0.0358	0.8562	0.0001			* Profitability
		RBUB	4	0.2137	0.0827	0.8869	0.0001			* Branch Structure
		MITC	5	0.1665	0.1475	0.9058	0.0001			* Liquidity
		TTDSS	6	0.2273	0.0995	0.9272	0.0001			* Capital Adequacy
		CSTA	7	0.6062	0.0028	0.9713	0.0001			* Risk
		TCRA	8	0.4121	0.0244	0.9829	0.0001			
		CATA	9	0.218	0.1477	0.9866	0.0001			
2	BANK2	OEOI	1	0.5602	0.0002	0.5602	0.0002	38	Stepwise	* Managerial Efficiency
		ROWN	2	0.4255	0.0033	0.7473	0.0001			* Ownership
		LLOE	3	0.4248	0.0006	0.9537	0.0001			* Liquidity
		CSTA	4	0.4273	0.0082	0.9735	0.0001			* Asset Quality & Risk
		TP	5	0.359	0.0182	0.0984	0.0001			* Technical Partnership
		TLCLL	6	0.2965	0.0441	0.9877	0.0001			* Cost Structure
		TOTTD	7	0.2327	0.095	0.9905	0.0001			* Head-Office Location
		OETC	8	0.3563	0.0525	0.9954	0.0001			* Revenue Sources
		RATA	9	0.4475	0.344	0.9974	0.0001			
		HOL	10	0.274	0.1481	0.9981	0.0001			
		TTDNB	11	0.4457	0.0704	0.9989	0.0001			
		LIOI	12	0.581	0.0279	0.995	0.0001			
3	BANK3	TP	1	0.6346	0.0001	0.6346	0.0001	38	Stepwise	* Technical Partnership
		OERA	2	0.8814	0.0001	0.9567				* Managerial Efficiency
		OETA	3	0.2985	0.0285	0.9828	0.0001			* Asset Quality & Risk
		RATA	4	0.72	0.0001	0.9952	0.0001			* Capital Adequacy
		TLD	5	0.3846	0.018	0.997	0.0001			
		TCTA	6	0.2785	0.0525	0.9978	0.0001			
4	ROWN	NISS	1	0.2137	0.0534	0.5904	8	37	Stepwise	* Cost Structure
		TOTTD	2	0.2436	0.0441	0.6902	0.0004			* Managerial Efficiency
		OERA	3	0.2787	0.0356	0.7766	0.0002			* Capital Adequacy
		OENB	4	0.5612	0.0013	0.9019	0.0001			* Asset Quality
		TTDSS	5	0.3179	0.0357	0.9507	0.0001			* Bank Size
		TCRA	6	0.2287	0.0984	0.9619	0.0001			* Liquidity
		LLTL	7	0.4353	0.0141	0.9741	0.0001			
		TTD	8	0.2981	0.0663	0.9818	0.0001			

		TLD	9	0.2479	0.1191	0.9864	0.0001			
		CATA	10	0.3028	0.993	0.9904	0.0001			
5	HOL	RATA	1	0.3489	0.0078	0.3489	0.0078	37	Stepwise	* Asset Quality
		TLCLL	2	0.3842	0.0061	0.599	0.0007			* Capital Adequacy
		CSCSD	3	6.3447	6.0132	0.7373	0.0001			* Liability Match
		TLD	4	0.2863	0.0327	0.8125	0.0001			* Branch Structure
		RBUB	5	0.1776	0.1776	0.8458	0.0001			* Liquidity
		CATA	6	0.2052	0.1038	0.8774	0.0001			
6	TP	OEOI	1	0.553	0.0003	0.553	0.0003	37	Stepwise	* Management Efficiency
		ROWN	2	0.5284	0.0006	0.7892	0.0001			* Ownership
		TTD	3	0.4388	0.0038	0.8817	0.0001			* Bank Size
		TDTT	4	0.2695	0.0393	0.9136	0.0001			* Cost Structure
		CSCSD	5	0.1651	0.1328	0.9278	0.0001			* Capital Adequacy
		TCRA	6	0.4187	0.0124	0.958	0.0001			* Risk Asset
		CATA	7	0.4762	0.4762	0.009	0.978			
		TLCLL	8	0.593	0.003	0.9911	0.0001			
7	BANK1	OEOI	1	0.6953	0.0001	0.6953	0.0001	38	Forward	* Variables Added
		TDCD	11	0.2787	0.1441	0.9914	0.0001			* Managerial Efficiency
		OISS	12	0.5578	0.0333	0.9962	0.0001			* Match of Liability
		OERA	13	0.5854	0.0454	0.9984	0.0001			* Asset quality
		TLTA	14	0.5377	0.0972	0.9993	0.0001			
8	BANK2	OEOI	1	0.5602	0.002	0.5602	0.0002	38	Forward	* Managerial Efficiency
		OERA	3	6818	0.0001	0.9909	0.0001			
9	BANK3	TCRA	7	0.3011	0.0521	0.9978	0.0001	38	Forward	
		LLOE	3	0.4354	0.0039	0.9755	0.0001			
10	ROWN	TTDMB	1	0.4792	0.001	0.4791	0.0001	37	Forward	*Dropped variables TTDSS, TCRA, LLTL, TTD, TLD, CATA
		OITC	6	0.3353	0.03	0.9348	0.0001			
			7	0.3011	0.0521	0.9545	0.0001			
			8	0.1989	0.1462	0.9635	0.0001			
			9	0.2902	0.0873	0.9741	0.0001			

adequacy comprise the important factors for classifying vulnerable and resistant banks according to BANK3. Managerial efficiency is indicated by OERA and OETA with partial R^2 of 88.1% and 29.85% respectively, liquidity by TLD with partial R^2 of 83.46%, risk (RATA) with partial R^2 of 72.0% and capital adequacy with R^2 of 27.9%. These factors produce a model with maximum ASCC of 0.9978 which is really impressive.

When the discriminant analyses were conducted with the forward selection method as has been done in all the previous periods, with respect to BANK1, 14 instead of 9 variables were selected indicating the addition of 5 variables. The added variables as indicated in equation 7 in table 7.4 include OEOI ranked first this time and TDCD, OISS, OERA and TLTA respectively which were ranked from 11th to 14th. The new ASCC was 0.993 compared with 0.9866 which was initially recorded. Both still represent very good models, at least as far as the correlation coefficient is concerned. The addition of five other variables could also have accounted for the improvement in ASCC though each of them was found individually significant.

With respect to BANK2, the variables OINB, OETC, RATA, HOL, TTDNB and LIOI were dropped while OEOI and OERA were added and ranked 1st and 3rd respectively. This development caused only a slight reduction in the ASCC from 0.9995 which was earlier recorded, to 0.9909. Really, one would expect the predictive ability of both models for classification of sample banks to be the same, particularly for small samples. It is noteworthy that this is one instance in which the forward selection analysis yielded a shorter list of significant variables. A net reduction of four variables is implied. In the previous sets of analysis, the tendency has been to include more variables. Also, for BANK3, the capital ratio TCTA was dropped and replaced with TCRA while LLOE (managerial efficiency) was included. The ASCC remained essentially the same, standing at 0.9978.

The stepwise discriminant analysis yielded models with ASCC values 0.9866, 0.9966, 0.9173 for classification variables BANK1, BANK2, and BANK3 respectively for 1989. The respective models contain 11, 10 and 6 selected variables out of the 40 (financial and other) variables considered. In all the cases managerial efficiency

and risk were significant factors.

Specifically, for BANK1, capital adequacy (TLSF, TCTA), managerial efficiency (OEOI, DVOI), risk (CATA), liquidity (CSTA) and profitability (OITC, OIRB) were significant groups of factors that were selected. We also have head-office location (HOL) and liability match (TDTTD) or better still cost structure. Of these variables DVOI had the highest partial R^2 , 40.88%.

Profitability (OITA, OIRB, OITC, OINB) and managerial efficiency, OETA, OERA, OETC) account for the majority of selected financial variables for BANK2 classification. Others include RBUB (branch structure), CATA (risk), TDCD (liability match), TLCD (liability match) and ROWN (ownership). OITA accounts for the highest partial R^2 of 47.2% followed by OINB with 41.1% and TLCD with 40.31%.

The six variables selected for BANK3 include TTD (bank size), RATA (risk), TCTA (capital adequacy), OETC (managerial efficiency), OITC (profitability) and LIOI (revenue sources). The highest partial R^2 is exhibited by the managerial efficiency assessment ratio, OETC, being 35.5%

The selected variables changed when the forward selection method was adopted, however, only for BANK2 and BANK3. With respect to BANK2, the variables TTDSS with partial R^2 of 35% and 42.5% respectively, were included while the ownership variable was dropped. The ASCC remained about the same 0.9969 compared with 0.9966 which represents the value for the initial model.

For BANK3 six (6) new variables were added. They include OEOI, LLTL, OERA, GSTA and TTDNB. ASCC improved with this 12-variable model compared with the 6-variable model. ASCC was 0.9909 for the former and 0.9173 for the latter. Among the selected variables TTDNB has the highest R^2 of 59.86% though it was selected last.

Tables 7.4 and 7.5 revealed an average of 38 and 40 variables respectively was considered in the analysis for 1988 and 1989. Tables 7.1 to 7.5 have exhibited a consistent increase in the number of variables considered; indeed, from 35 in 1986 to 40 in 1989. By 1989, there was comprehensive data for all variables. Again, this

Table 7.5: Results of Discriminant Analysis for Different Performance Criteria in 1989

EQ.	Class	Selected Variables	Rank	R ²	Pr > F	ASCC	Pr > ASCC	Number of Variables	Selection Method	Comment
1	BANK1	TCTA	1	0.3887	0.0033	0.0389	0.0033	40	Stepwise	* Capital Adequacy
		CATA	2	0.265	0.0241	0.5566	0.0011			* Managerial Efficiency
		TTDMB	3	0.4116	0.0041	0.7356	0.0001			* Head-Office Location
		TLSF	4	0.3736	0.0091	0.8344	0.0001			* Risk and Asset Quality
		DVOI	5	0.4088	0.0077	0.9021	0.0001			* Liquidity
		TOTTD	6	0.2707	0.0468	0.9286	0.0001			* Profitability
		HOL	7	6.2436	0.0729	0.9459	0.0001			* Liability Match
		OIRB	8	0.3465	0.0343	0.9646	0.0001			
		OE0I	9	0.2913	0.071	0.975	0.0001			
		MITC	10	0.2861	0.09	0.9821	0.0001			
		CSTA	11	0.2485	0.1425	0.9866	0.0001			
2	BANK2	OE0I	1	0.3727	0.0043	0.3727	0.0043	40	Stepwise	* Managerial Efficiency
		OETA	2	0.2706	0.0224	0.5424	0.0013			* Branch Structure
		RBUB	3	0.1789	0.0803	0.6243	0.011			* Risk & Asset Quality
		CATA	4	0.1569	0.1155	0.6832	0.0011			* Liability Match
		TDCD	5	0.1898	0.0917	0.7433	0.0009			* Profitability
		OITA	6	0.4717	0.0047	0.8644	0.0001			* Liquidity
		OIRB	7	0.4031	0.0147	0.909	0.0001			* Ownership
		OERA	8	0.2724	0.0818	0.9617	0.0001			
		OETC	9	0.3698	0.0471	0.9758	0.0001			
		OITC	10	0.3618	0.0658	0.9846	0.0001			
3	ROWN	TLCD	11	0.4025	0.0665	0.9908	0.0001			
		OINB	12	0.4109	0.0868	0.9945	0.0001			
		ROWN	13	0.3955	0.0949	0.9966	0.0001			
4	BANK3	TID	1	0.3322	0.0098	0.3322	0.0007	40	Stepwise	* Bank Size
		RATA	2	0.2094	0.0562	0.6628	0.0005			* Risk

		TCTA	3	0.3208	0.0178	0.7709	0.0001			* Capital Adequacy
		OETC	4	0.3548	0.0149	0.8522	0.0001			* Managerial Efficiency
		OITC	5	0.2975	0.0355	0.8962	0.0001			* Revenue Sources
		LIOI	6	0.2386	0.0647	0.6173	0.0001			
5	ROWN	DVOI	1	0.3857	0.0035	0.3857	0.0035	39	Stepwise	* Managerial Efficiency
			2	0.2074	0.0575	0.6206	0.0019			* Branch Structure
			3	0.4166	0.0051	0.7787	0.0012			* Asset Quality
			4	0.335	0.0188	0.8528	0.0001			* Bank Size
			5	0.2354	0.0568	0.875	0.0001			
			6	0.1779	0.1174	0.8972				
6	HOL	RATA	1	0.2134	0.0403	0.2134	0.0403	39	Stepwise	* Risk & Asset Quality
		TTO	2	0.1494	0.1021	0.3309	0.0328			* Bank Size
		NISS	3	0.1321	0.1383	0.4193	0.03			* Ownership
		ROWN	4	0.2459	0.0429	0.5621	0.0107			
7	BANK2	TTDSS	8	0.3503	0.0331	0.9474	0.0001	40	Forward	* Dropped variable
			14	0.4245	0.1128	0.9969	0.0001			ROWN
8	BANK3	OE01	1	0.3613	0.0051	0.3613	0.0051	40	Forward	* Loan Quality
		LLTL	8	0.195	0.1309	0.9334	0.0001			* Managerial Efficiency
		DERA	9	0.2668	0.0856	0.9572	0.0001			* Liquidity
		GSTA	10	0.31	0.0752	0.9663	0.0001			* Bank Size
		TTDNB	12	0.5986	0.0144	0.9909	0.0001			* Variables Included
9	ROWN	TP	2	0.2208	0.0424	0.5213	0.0019	39	Forward	* Dropped variables LLTL and OINB.
			6	0.2352	0.0669	0.8874	0.0001			

goes to show that the data situation improved the closer we got to the end of the study horizon. As previously indicated, the changes in the number of variables considered in the analysis has probably had an effect on the variables selected in each model.

For 1989, based on the forward selection method bank liquidity is also seen to be significant with respect to all classifications BANK1, BANK2 and BANK3 (table 7.5). Also, we should mention that the variable TP was not considered in the above discriminant analysis.

The discriminant analyses conducted in respect of BANK1, BANK2 and BANK3 reveals in the results, the significance of different combinations of factors in distinguishing between vulnerable and resistant banks, or better still bank performance among Nigerian commercial banks. The analysis on BANK1 reveals that the existence or non-existence of technical partnership agreements distinguished between vulnerable and resistant banks during 1985 and 1986, being the pre-SAP period. We observe also from the same table that, of the factors identified for distinguishing between banks based on technical partnership, three, namely TTD, NITC and NISS, were found to be significant in both 1985 and 1986. A summary of the combination of financial variables selected by the discriminant analysis is presented in Table 7.6.

The significance of TP in 1985 and 1986 as well as in 1987 can be appreciated from the cross-tabulation of the technical partnership agreement variable (TP) with the different bank performance classifications, BANK1, BANK2 and BANK3.

We find from Table 7.7 that for BANK1, all the banks without TP are classified as vulnerable while 25% of those with technical partnership agreement are also classified as vulnerable in 1986. The trend is very similar for 1987. While all the banks without TP agreement were still classified as vulnerable, going by BANK1 classification, 16.7% of the other category of banks were classified as vulnerable. The same trend still remained in 1987. However, in 1988 one (1) of the eight (8) banks without TP agreement and which had hitherto been classified as vulnerable was classified as resistant. The figure increased to three (3) in 1988, along with the

Table 7.6: Summary of Selected Significant Variables of the Discriminant Analysis (1985-1989)

	Variables	1985	1986	1987	1988	1989
1	BANK1	TP	TP	OE0I	OETA	TCTA
		TDTTD	OESS	RATA	LIOI	CATA
		TDCD	OENB	ROWN	OINB	TTDNB
		TTDNB	NITC	TTDNB	RBUB	TLSF
		OISS		RBUB	NITC	DVOI
				OISS	TTDSS	TDTTD
				TP	CSTA	HOL
				LIOI	TCRA	OIRB
				NITC	CATA	OE0I
				LLOE		NITC
						CSTA
2	BANK2	TP	TP	OE0I	OE0I	OE0I
		TDTTD	OESS	HOL	ROWN	OETA
			OENB	TLCLL	LLOE	RBUB
			RBUB	RBUB	CSTA	CATA
			OETC	OITC	TP	TDCD
					TLCLL	OITA
					TDTTD	OIRB
					OETC	OERA
					RATA	OETC
					HOL	OITC
					TTDNB	TLCD
					LIOI	OINB
						ROWN
3	BANK3	OE0I	NITC	TLCLL	TP	TTD
		TLSF	TP	TLSF	OERA	RATA
				NITC	OETA	TCTA
				HOL	RATA	OETC
				HOL	TLD	OITC
				CSCD	TCTA	LIOI
				DVOI		
				TTDSS		

4	ROWN	OESS	OESS	OESS	NISS	DVOI
		TTDNB	TTD	TTD	TDTTD	NISS
		TTD		TDTTD	OERA	RBUB
		CATA		OITC	OENB	TTDNB
				TISF	TTDSS	LLTL
					TCRA	OINB
					LLTL	
					TTD	
					CATA	
5	HOL	OEOI	TP	TP	RATA	RATA
		TLCD	LSF	TDTTD	TLCLL	TTD
		TTD		TLD	CSCSD	NISS
					RBUB	ROWN
					TLD	
					CATA	
6	TP	TTD	NITC	OEOI	OEOI	
		NITC	ROWN	ROWN	ROWN	
		CSCSD	NISS	NISS	TTD	
		TDTTD	DVOI	HOL	TDTTD	
		NISS	OENB	TLD	CSCSD	
			TTD	RACA	TCRA	
			OINB	OENB	CATA	
			TTDNB	DVOI	TLCLL	
			HOL			
			OETC			

Table 7.7: Cross-Tabulation of Technical Partnership by Bank Performance

Class Variable	Characteristic	1985		1986		1987		1988		1989	
		Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.
BANK1	TP exists	3	9	2	10	3	9	3	9	5	7
	%	25	75	16.7	83.3	25	75	25	75	41.7	58.3
	No TP	8	0	8	0	8	0	7	1	5	3
	%	100	0	100	0	100	0	87.5	12.5	62.5	37
BANK2	TP exists	3	9	0.2	10	3	9	1	11	3	9
	%	25	75	16.7	63.3	25	75	8.3	91.7	25	75
	No TP	6	2	7	1	5	3	6	2	5	3
	%	75	25	87.5	12.5	62.5	37.5	75	25	62.5	37.5
BANK3	TP exists	2	10	1	11	2	10	0	12	2	10
	%	16.7	83.3	8.3	91.7	16.7	83.3	0	100	16.7	83.3
	No TP	4	4	6	2	4	4	6	2	4	4
	%	50	50	75	25	50	50	75	25	50	50

number of banks which had TP agreement that were classified as vulnerable. This development between 1988 and 1989 seems responsible for the insignificance of TP among the selected variables from the discriminant analysis. This shows essentially that relative to other banks, those without TP agreement improved in performance over 1988 and 1989, though much more in 1989.

Going back to our earlier discussion, with respect to BANK1 classification, over the SAP period, 1987 to 1989, notable determinants of bank performance, as shown in Table 7.6 include managerial efficiency and risk. Branch structure and revenue sources were significant in 1987 and 1988 while capital adequacy and liquidity had been significant in 1988 and 1989.

During the pre-SAP period, technical partnership agreement still remained very significant in association with bank performance. Recall as noted above, that over this period all banks without technical partnership agreement were classified vulnerable for BANK1. Again, managerial efficiency was prominent in each of the periods 1987, 1988 and 1989. In particular, the variable OEOI ranked first among the selected variables. Head-office location and capital adequacy were significant factors between 1987 and 1988. It seems that while the significance of TP agreement can be appreciated from the cross-tabulation in table 7.7, that of head-office location (HOL) may not be easily appreciated from table 7.8. We find from this table that the cross tabulation in respect of BANK2 for 1987 is not significantly different from 1988. The distribution in 1988 is exactly the same as that in 1986, the period in which HOL was deemed seemingly unrelated to bank performance. The distribution in 1989 is also the same with that of 1987 and HOL was not found significant in 1989.

Ownership has since 1988 been found to be a significant determinant of bank performance based on BANK2 classification (see Table 7.6). Looking at table 7.9 a cross-tabulation of ownership and bank performance is displayed for each of the classification variables. For BANK2, we find that the pattern has been the same since 1985 and up till 1987. It can be said to have changed significantly between 1988 and 1989.

Table 7.8: Cross-Tabulation of Head-office Location by Bank Performance

Class Variable	Characteristic	1985		1986		1987		1988		1989	
		Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.
BANK1	Lagos	4	8	4	8	5	7	6	6	7	5
	%	33.3	66.7	33.3	66.7	41.7	58.3	50	50	58.3	41.7
	Other	7	1	6	2	6	2	4	4	3	5
	%	87.5	12.5	75	25	75	25	50	50	37.5	62.2
BANK2	Lagos	3	9	4	8	5	7	4	8	5	7
	%	25	75	33.3	66.7	41.7	58.3	33.3	66.7	41.7	58.3
	Other	6	2	5	3	3	5	3	5	3	5
	%	75	25	62.5	37.5	37.5	62.5	37.5	62.5	37.5	62.5
BANK3	Lagos	3	9	3	9	3	9	3	9	4	8
	%	25	75	25	75	25	75	25	75	33.3	66.7
	Other	3	5	4	4	3	5	3	5	2	6
	%	37.5	62.5	50	50	37.5	62.5	37.5	62.5	25	75

Table 7.9: Cross-Tabulation of Bank Ownership By Bank Performance

Class Variable	Characteristic	1985		1986		1987		1988		1989	
		Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.	Vul.	Res.
BANK1	Public	9	5	8	6	10	4	8	6	7	6
	%	64.3	35.7	57.1	42.9	71.4	28.6	57.1	42.7	53.9	46.1
	Private	2	4	2	4	1	5	2	4	4	4
	%	33.3	66.7	33.3	66.7	16.7	83.3	33.3	66.7	42.9	57.1
BANK2	Public	7	7	7	7	7	7	7	7	6	7
	%	50	50	50	50	50	50	50	50	46.2	53.8
	Private	2	4	2	4	1	5	0	6	2	5
	%	33.3	66.7	33.3	66.7	16.7	83.3	0	100	28.6	71.4
BANK3	Public	5	9	6	8	5	9	6	8	5	8
	%	35.7	64.3	42.9	57.1	35.7	64.3	42.9	57.1	38.5	61.5
	Private	1	5	1	5	1	5	0	6	1	6
	%	16.3	83.3	16.3	83.3	16.3	83.3	0	100	14.3	85.7

Examining the discriminant results for BANK2, no common trend could be observed between 1985 and 1986. However, between 1987 and 1989, capital adequacy was found to be significant in each period as well as managerial efficiency. In 1988 and 1989, risk (RATA) was significant.

Table 7.6 also reveals the significance of managerial efficiency (OESS) and bank size (TTD) in distinguishing between predominantly-public and predominantly-private banks. We found that privately owned banks had significantly higher operating expenses per staff. This is also confirmed from the univariate tests in Tables 6.24 to 6.27. Also, we found that over the period total deposits (TTD) was higher on the average, for private than public banks. Capital adequacy was significant in 1987 and 1988 while asset quality (LLTL) was significant between 1988 and 1989. Tables 6.27 and 6.28 reveals that the quality of assets of private banks was higher than that of public banks, as measured by LLTL.

With respect to head-office location, the selected factors for 1985 and 1986 had nothing in common. Over 1987 to 1989, liquidity (TLD) made the difference between 1987 and 1988 while risk (RATA) also made a difference in 1988 and 1989. It is interesting that the univariate tests did not reveal any significant differences in liquidity based on TLD, between banks with head-office in lagos and those outside Lagos in 1987 and 1988. Risk, however, in the form of RATA was found to be significantly different for the classes of banks in 1988 and 1989. Indeed, on the average RATA was higher for Lagos-based banks than the other banks.

7.4 An Assessment of the Classification Ability of the Discriminant Models

Usually a discriminant model or criterion can be evaluated by its performance when adopted in the classification of the same set of sample observations or a completely different set of future observations. This is necessary to obtain estimates of the error rate associated with the model. Two types of errors can occur in this classification. They are the *type I* and *type II errors*. The *type I error* is made when a bank that is actually vulnerable is wrongly classified as a resistant bank while a *type II error* is made when a resistant bank is wrongly classified as a vulnerable bank.

Both are misclassifications. The *type I error* can be referred to as a **False Positive Rate (FPR)** since it tends to give an indication that all is well with a problem bank, while the *type II error* is the **False Negative Rate (FNR)** as it portrays a resistant bank as vulnerable thus generating a false alarm. The FPR is the percentage of vulnerable banks wrongly classified as resistant while the FNR is the percentage of resistant banks wrongly classified as vulnerable. The overall error rate estimate is defined as the proportion of MisClassified observations in the total sample observations. This is represented in the relevant tables by MC. The overall correct classification rate is denoted by CC, which is $(1 - MC)$.

The discriminant model is rarely employed to reclassify the same set of sample observations upon which it was based due to possible bias that may result from such classification. It is felt, therefore, that its appropriateness/adequacy can be evaluated and further established when it is used to reclassify a separate set of sample observations for which there exist full *a priori* information. This is referred to as "*resubstitution*" analysis.

In the assessment of the classification ability of the discriminant models the (i) Resubstitution and (ii) Crossvalidation results, therefore, come in useful. Results of both assessments indicate the classification of sample banks into vulnerable and resistant groups. As earlier mentioned, ideally, in resubstitution analysis, the models should be applied to the classification of an independent sample. However, since no independent sample exists in our case, we rely on the resubstitution results for the same sample as both a preliminary and indicative assessment, noting the potential bias.

To further enhance our reliance on the models, we embark upon the cross-validation analysis which yields a nearly unbiased sample classification. This other method to reduce bias is the product of Lachenbruch and Mickey (1968). Crossvalidation treats $n-1$ out of n training observations as a training set. It determines the discriminant functions based on these $n-1$ observations and then applies them to classify the excluded observation. This procedure is continued until each observation has been excluded once and by implication, each has been classified

once. Though this method is known to achieve a nearly unbiased estimate it will normally be associated with a relatively large variance (SAS/STAT, 1990). The same technique was adopted in Sinkey (1975) to assess the adequacy or performance of discriminant models developed for assessing the characteristics of problem banks. The crossvalidation (Lachenbruch) error rates were generally found to be higher than those associated with the resubstitution results.

In the latter sections of this chapter we also specified the discriminant models as logit models to enable a further assessment of their reliability (by resubstitution) and to trigger whatever differences may distinguish discriminant from logit models. Both the resubstitution and crossvalidation analyses are embarked upon to inform us of the appropriateness of each of the identified models as well as aid comparison between those based on stepwise methods and those based on forward or backward methods. Intuitively, one can expect such analyses to provide a framework for the selection of a suitable or 'best' discriminant model by a typical regulatory/supervisory authority. Indeed, the same would be the case for assessing the suitability of the performance criteria. In this light, it can be appreciated that while it is very important to identify factors critical to commercial bank performance, it is equally important to be able to evaluate the different models that may be isolated for their adequacy. The same applies to the basis for classifying banks. In what follows, we have attempted to initiate preliminary efforts in this regard.

The results of resubstitution and crossvalidation for the discriminant models earlier discussed with some variants are presented in Table 7.10. *SSY* represents *sensitivity* as used in the SAS LOGISTIC procedure to mean the proportion of vulnerable banks that were correctly predicted as vulnerable while *SFY* represents *specificity*, being the proportion of resistant banks rightly classified as resistant. *FPR*, *FNR*, *CC* and *MC* have been previously explained. The models examined are limited to the 1989 period due to space and the belief that it will suffice to indicate the ability of other models obtained for the other periods.

The first model in Table 7.10 represents the full model obtained in a discriminant analysis relating to BANK1 based on the stepwise selection method.

Table 7.10: Assessment of the Classification Ability of Discriminant Model By Classification Analysis for 1989

Eq	Class	Selected Vars.	Resubstitution						Crossvalidation						N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC	
1	BANK1	TCIA, CATIA													20
		TTDMB, TLSF													
		DVOI, TDITD													
		HOL, OIRB, OE01													
		MITC, CSTA													
2	BANK1	TCIA, CATIA													20
		TTDMB, TLSF													
		DVOI, TDITD													
		HOL, OIRB, OE01													
		MITC													
3	BANK1	TCIA, CATIA	100	100	0	0	100	0	90	100	0	10	95	5	20
		TTDMB, TLSF													
		DVOI, TDITD													
		HOL, OIRB													
4	BANK2	OE01, OEIA													20
		RBUR, CATIA													
		TDOD, OITA													
		OIRB, TTDS5													
		OEIA, OETC													
5	BANK2	OITC, TLCD													20
		OE01, OEIA													
		RBUR													
		TDOD, OITA													
		OIRB, TTDS5													
		OEIA, OETC	100	100	0	0	100	0	75	83.3	16.7	25	79.2	20.8	
		OITC, TLCD													
		OIRB, ROOM													

6	BANK2	OE01, OE1A	87.5	100	0	12.5	93.7	6.3	75	83.3	16.7	25	79.2	20.8	20	
		OT1A, OT1B,														
		TTDSS, OETC														
7	BANK3	TTD, RA1A,														20
		TC1A, OETC,	100	100	0	0	100	0	83.3	100	0	16.7	91.7	8.3		
		OT1C, LI01														
8	BANK3	TTD,														20
		TC1A, OETC,	100	100	0	0	100	0	83.3	92.7	7.1	16.7	88.1	11.9		
		OT1C, LI01														
9	ROMM	DVOI, MISS,														
		RBUB, TTDNB,	100	100	0	0	100	0	100	85.7	14.3	0	92.9	7.1		
		LL1L, O1NB														
10	ROMM	DVOI, MISS,														20
		RBUB, TTDNB,	100	100	0	0	100	0	100	85.7	14.3	0	92.9	7.1		
		LL1L														
11	HOL	RA1A, TTD,	91.7	75	25	8.3	83.3	16.7	91.7	75	25	8.3	83.3	16.7	20	
		MISS, ROMM														
12	HOL	RA1A, ROMM	66.7	62.5	37.5	33.3	64.6	35.4	66.7	62.5	37.5	33.3	64.6	35.4	20	

The results of resubstitution indicate that the discriminant model is perfect for classifying the sample banks upon which it was based, in terms of performance. Vulnerable and resistant banks were respectively correctly classified. As mentioned earlier, however, one should suspect bias, since the same sample served as the basis for model estimation. Interestingly, however, the crossvalidation results were also very impressive. The overall correct classification rate is 95%. Specifically, 90% of vulnerable banks were correctly predicted while 100% of resistant banks were correctly predicted. Consequently, the false positive rate (FPR) or type I error rate is 10%.

Two variants of the model for BANK1 were also assessed. One specified the full model with the exception of liquidity (CSTA) while the other was the full model without profitability (NITC) and OEOI, a managerial efficiency related variable. The ratio DVOI, however, still represented a managerial efficiency related variable in the two models. The resubstitution and crossvalidation results were the same with that of the full model. This suggests that the models are equally good. This may be appreciated when it is found out (table 7.5) that the maximum ASCC of the full model is 0.9866, without CSTA, 0.9821 and without OEOI and NITC, 0.9750. It may be the case that for small samples they could yield the same results. However, as the sample becomes large, one may then begin to observe major differences.

The full discriminant model obtained in respect of classification variable BANK2 also predicted the performance class of the sample banks with 100% accuracy going by the resubstitution results. All vulnerable and resistant banks were correctly classified. The crossvalidation results indicate an overall correct classification rate of 94.7%. The FPR from the crossvalidation results is 12.5% while the FNR is 0% indicating that all the resistant banks were correctly classified.

Two variants of this model were also examined. Firstly, we assessed the full model without the risk variable, CATA, which as can be observed from table 7.5 had the lowest partial R^2 (0.1569) with BANK2 among all selected variables. The resubstitution result also correctly classified all resistant and vulnerable banks. This development, however, reduced the correct classification rate for the crossvalidation

results, from 94.7% to 79.2%. Also, both the FPR and FNR increased significantly. The FPR was 25%, indicating that a quarter of all vulnerable banks were misclassified as resistant banks. This error rate is rather high. In spite of the fact that CATA ranks lowest in terms of the partial R^2 , it ranked 4th in order of selection of variables into the model. It seems quite a significant variable going by the crossvalidation results.

The second variant of the model excluded CATA as well as the last seven (7) variables with regard to the partial R^2 . Only six (6) variables were used, reflecting profitability and managerial efficiency as significant factors. The results of this model was the same with the crossvalidation results for the first variant. The credibility of the model declined considering the resubstitution results. While all the resistant banks were correctly predicted, 12.5% of vulnerable banks were wrongly classified as resistant banks.

The resubstitution results for the full model obtained for BANK3 reflected correct classification of all banks. The crossvalidation results also reflect correct classification of all resistant banks. However, the FPR is 16.7% while the overall error rate is 8.3%. A variant of the model which involved all variables, except RATA that has the lowest partial R^2 was analysed. The resubstitution results remained unchanged, showing 100% correct classification. The overall classification ability of the model is reduced in this case following the crossvalidation results. Infact the FPR remained the same while the FNR worsened. In this case the FNR was 7.1% compared with 0% for the full model. To the extent that the type I error as indicated by the same value for FPR is the same and the cost of FNR (i.e classifying a resistant bank as vulnerable) is not as high as that associated with FPR, this development is not really critical.

From the above discussions we find that the full models perform very well based on resubstitution results. The crossvalidation results also indicate good performance, though the FNR gets as high as 12.5% in some cases. This seems rather high. Also, we find that as the classification criterion is relaxed (from BANK1 to BANK3) it becomes more difficult to identify factors that clearly distinguish the

categories of banks as the correct classification rate declines correspondingly. This rate was 95.5% for BANK1, 94.7% for BANK2 and 91.7% for BANK3.

The resubstitution results indicated, in respect of ownership (ROWN), that the identified factors are able to classify all banks correctly in terms of ownership. SSY being 100.0% in the crossvalidation results indicates that all predominantly public banks were correctly classified. On the other hand, 14.3% of private banks were wrongly classified. The overall correct classification rate of 92.9% is impressive. It should be noted that the implications of type I and type II errors in this case are not of any adverse consequence. The essence of such a model was to identify factors that distinguish banks by ownership. That is, perhaps based only on an examination of these factors one can identify the ownership of these banks. Dropping the last selected variable, OINB, made no change in both the resubstitution and crossvalidation results. The maximum ASCC for this and the earlier (full) model were 0.8750 and 0.8972 respectively.

The ability of the discriminant model to classify banks by head-office location was rather weak. While 91.7% of banks with head-office in Lagos were correctly classified, 75.5% of the other set of banks were correctly classified. The overall correct classification rate is 83.3%. The error rate is rather high. The rate grew worse with the dropping of two variables, NISS and ROWN. Of all the models, this seems the weakest. The misclassification rate for the modified model was 35.4%. The poor performance of this model can be appreciated from an examination of the ASCC associated with the model. The maximum ASCC was 0.5621. This does not compare with the ASCC for other models which was in most cases about 0.91 (see table 7.5).

7.5 A Logistic Analysis of Commercial Bank Performance in Nigeria

Logit or Logistic analysis represents an alternative method of analysis to the discriminant analysis for classifying observations into two or more known groups on the basis of one or more quantitative variables. The **LOGISTIC** procedure also available in the *SAS packages* which fits linear regression models for binary or

ordinary classification variables using the method of maximum likelihood (SAS/STAT, 1990, p.1072) was adopted for the analysis in this section. The Logit analysis was conducted essentially as an alternative method of attaining one of the major objectives of this study as well as to serve as a basis for the identification of alternative model specifications to which the discriminant models can be compared, especially in terms of the number of and the particular variables comprising the models and consequently the classification ability. In previous studies, either of the two and not both have been used with the claim that the results could not have been much different since they both represented similar tools for solving a particular problem. It is, therefore, not surprising to find that the **LOGISTIC** procedure is similar to the **STEPPDISC** procedure in that it is capable of selecting the best models or combination of models via various methods such as the Forward, Backward and Stepwise selection methods.

In the forward selection method, the intercept is first estimated. Next, an *adjusted chi-squared statistic* is examined for each variable excluded from the model, and the most significant at the significance level specified for entry into the model, is entered. And once a variable is entered it is not removed. This process continues until none of the remaining variables meet the specified level for entry based on their individual adjusted chi-squared statistic.

The backward selection method is the opposite of the forward selection method. In this case, the parameters for the complete model (with all the candidate variables) are first estimated. The univariate tests based on the Maximum Likelihood Estimates (MLEs) of model parameters are examined and the least significant variable that does not meet the significance level specified for staying in the model is dropped. Once a variable is dropped, it cannot be re-entered. The model is again estimated with the remaining variables and this process continues until no other variable in the model meets the specified level for removal.

The stepwise selection method is similar to the forward method except that variables already in the model do not necessarily remain. Variables are entered into and removed from the model in such a way that each forward selection step is

followed by one or more backward elimination steps. That is, after the entry into the model of a qualifying variable (which meets the significance level specified for entry), then the model is fully estimated via the MLE method and the parameters of the model subjected to univariate tests to ascertain their individual significance. If all are found to be significant, the existing variables stay in the model. However, if any is found to be insignificant, the associated variable is dropped from the model and never reconsidered at subsequent steps. Next, the adjusted chi-squared statistic is examined for variables not in the model (which have not been dropped in earlier steps) for the most significant qualifying for entry and this is introduced into the model. The stepwise selection process terminates if no further variable can be added into or dropped from the model.

The **LOGISTIC** procedure generates quite a large amount of output and those that are relevant for our purpose include; the table which gives simple statistics for explanatory variables such as mean, standard deviation, minimum and maximum values criteria or statistics for assessing model fit and the analysis of MLEs. The various criteria for assessing model fit include the **-2 Log L(likelihood)** and the **Score** statistics which are based on the maximum likelihood for fitting a model with and without intercepts. These test the joint effect of the selected explanatory variables. The chi-square statistics and prob-values for both statistics are given. These indicate the level at which each of the selected variables in the model are significant. The analysis of MLEs consists of the MLE of the parameters, the standard error, the **Wald chi-square** which is computed as the square of the parameter estimate divided by its standard error estimate and the prob-value of the Wald chi-square statistics.

There is also the classification table which can be generated to assess the ability of the models to reclassify the sample upon which they were based. This is essentially similar to the resubstitution results obtained in the discriminant analysis. Specificity (SFY), Sensitivity (SSY), FNR, FPR, CC and MC are also meaningful here.

Initially when the logit regression analysis was conducted, it was difficult to obtain convergence for the MLEs. These trials had been based on the default

significance entry and staying levels (5%) stipulated for the **LOGISTIC** procedure, the maximum number of iterations (25) and the convergence criterion (0.0001). These were thought to be quite strict. An increase in the maximum number of iterations did not resolve the issue. Consequently, the significance level was reviewed upward to 15% to coincide with the significance levels considered in the univariate tests as well as that adopted in the discriminant analysis. The latter, it was thought, would make for effective comparison of the models specified by both methods. The convergence criterion was reduced to 0.01 due to the fact that there are imperfections in the data. These changes produced convergence in the models and some interesting results.

The results of the logit regression analyses are presented in tables 7.11 to 7.20. We present also an assessment of the predictive ability of the logit models using the resubstitution and crossvalidation results of a corresponding discriminant analysis on the logit model specification. In the table on results of logit forward analysis we have the **prob-values** for the Wald chi-square, the rank of selected variables, the prob-values associated with the **-2 Log L** and **score** statistics (or better still, the level at which the model is significant) and the diagnostics (**SSY, SFY, FPR, FNR, CC & MC**) based on the classification table. The latter part of the table (**VV, VR, RV, RR**) indicate the details of classification results. Under column **VV** we indicate for each model the number of Vulnerable banks correctly classified as Vulnerable and for **VR**, the number of Vulnerable banks wrongly classified as Resistant banks. **RV** and **RR** are explained in a similar fashion.

For 1985, the technical partnership (TP) agreement variable and the risk variable (RATA) were selected as the most significant variables among the list of 20 variables considered. Both factors were significant at 5% level as revealed by the **Pr > X²** values. The entire equation or model is also significant at 1% level given the prob-value corresponding to both **-2 Log L** and **Score** statistics. The model performed creditably well as can be assessed from the zero values of both the FPR and FNR as well as the MC. All vulnerable and resistant banks were correctly predicted.

Table 7.11: Results of Logit Analysis of Bank Performance in 1985

Eq	Class Var.	Selected Var.	Rank	Pr > χ^2	-2 LOG L	SCORE	SSY	SFY	FPR	FNR	CC	MC	VV	VR	RV	RR	OBS
1	BANK1	TP	1	0.0001	0.0001	0.0005	100	100	0	0	100	0	9	0	0	9	18
		RATA	2	0.035													
		TP	1	0.0049	0.0001	0.0095	100	100	0	0	100	0	7	0	0	11	18
		NITC	2	0.0847													
3	BANK3	OE01	1	0.0046	0.0001	0.0168	100	100	0	0	100	0	4	0	0	14	18
		TTD	2	0.1301													
		OESS	1	0.0003	0.0001	0.0008	100	100	0	0	100	0	13	0	0	5	18
		TTD	2	0.0417													
5	HOL	OE01	1	0.0331	0.0001	0.0824	100	100	0	0	100	0	11	0	0	7	18
		NITC	2	0.0935													
		OITC	3	0.0808													
		RBUB	4	0.0656													
6	TP	NISS	1	0.0024	0.0001	0.0024	100	100	0	0	100	0	10	0	0	8	18

The model performance based on the (re)classification table obtained by the **LOGISTIC** procedure is the same for BANK2 and BANK3 also. In each case all vulnerable and resistant banks were correctly predicted. For BANK2, the TP agreement was significant at 1% level while profitability was significant at 10% level. The equation still represents a good model given the associated goodness-of-fit statistics. Also, for BANK3, managerial efficiency (OEI) made the difference in bank performance at 1% level while total deposits (TTD) was significant at 15% level. Comparing these models, a close look at the prob-values for the score statistic will seem to indicate that we expect the model for BANK1 to be better than that for BANK2 which in turn should be better than the model for BANK3, in their predictive abilities. We observe an increase in the prob-values for the respective models.

In table 7.12 we have the resubstitution and crossvalidation results of these models based on a discriminant analysis. This procedure was adopted to reduce potential bias inherent in the Logit reclassification of the sample observations; an argument that is in line with why crossvalidation analyses are necessary after the initial resubstitution analyses. The results of the MDA classification using same logit model specification do not particularly look as impressive as they tended to be portrayed by the logit classification. The false positive rate (FPR) or better still the type I error was positive and higher when logit models are subjected to discriminant reclassification. The FPR was 11% for BANK1, 14.3% for BANK2 and 50% for BANK3. That for BANK3 was unduly high, thus considerably discrediting the model. These reclassification results confirm our earlier observation on the declining ability of the models to classify sample banks by performance as reflected by the increasing prob-value of the score statistic. In the case of BANK1 and BANK3 all resistant banks were rightly classified. Only 81.8% were rightly classified for BANK2. Interestingly, in all cases the resubstitution and crossvalidation results were the same. This fact may be taken to indicate that the results represent a true assessment of the models. Furthermore, it perhaps reflects the added advantage and benefits associated with comparing the discriminant model analyses with a corresponding logit analyses,

Table 7.12: Assessment of the Classification Ability of Logit Model By Discriminant Classification Results for 1985

EQ	Class Var.	Selected Vars.	Resubstitution							Crossvalidation							N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC			
1	BANK1	TP	88.9	100	0	11	94.4	5.6	88.9	100	0	11	94.4	5.6	18		
		RATA															
2	BANK2	TP	85.7	81.8	18.3	14.3	83.8	16.2	85.7	81.8	18.3	14.3	83.8	16.2	18		
		NITC															
3	BANK3	OE01	50	100	0	50	75	25	50	100	0	50	75	25	18		
		TTD															
4	ROWN5	OE55	69.2	40	60	30.8	55	45	61.5	20	80	38.5	40.8	59.2	18		
		TTD															
5	HOL	OE01	90.1	71.4	28.6	9.1	81.2	18.8	72.7	57.1	42.9	27.3	64.9	35.1	18		
		NITC															
		OITC															
		RBUB															
6	TP	NISS	70	100	0	30	85	15	70	100	0	30	85	15	18		

which many studies have simply explained away by virtue of the similarity of purpose of the two distinct techniques.

The models obtained for ROWN, HOL and TP respectively, which are shown to have good classification ability by the logistic analysis in the resubstitution and cross-validation results of the discriminant analysis indicated less than impressive models. For ROWN, the FPR for resubstitution was 30.8% while it was 38.5% for crossvalidation. The FNR is also too high, at 80.0%. The HOL and TP models are better models going by the lower values of FNR. While the FPR for resubstitution associated with HOL was 9.1%, it increased to 27.3% based on the crossvalidation results. The crossvalidation and resubstitution results for TP were the same. Managerial efficiency and profitability essentially distinguished between banks with head-office located in Lagos and those with head-office outside Lagos.

For 1986, technical partnership (TP) agreement and managerial efficiency (OETC) made the difference for BANK1, profitability (NITC) and managerial efficiency (OEIO) were significant for BANK2 while only NITC was significant for BANK3 as shown in table 7.13. In all the models the selected variables were significant at 5% level while the models were significant at 1% level. All the models rightly classified the banks by performance in 1986. The prob-values for the score statistic indicate that the classification ability of BANK1 model is bound to be better than that of BANK3 which in turn will be better than that of BANK2. The resubstitution and crossvalidation results in table 7.14 confirm this.

Overall, based on the CC rate, the BANK1 model performs better than BANK3 model which is better than BANK2 model. The CC rate for these models were 90%, 88.5% and 85.3% respectively. Going by the FPR, BANK3 is better than that of BANK2 which is better than that of BANK1. These are 0%, 11.1% and 20% respectively. Recall that this has more significant adverse implication than the overall rates, since the FPR represents the probability of occurrence of the event of a wrong classification of a vulnerable bank as a resistant bank. Again the resubstitution and crossvalidation results are the same.

The models for ROWN, HOL and TP are generally much better than those

Table 7.13: Results of Logit Analysis of Bank Performance in 1986

[illegible]

Table 7.14 Assessment of the Classification Ability of Logit Model By Discriminant Classification Results for 1986

Eq	Class Var.	Selected Vars.	Resubstitution						Crossvalidation						N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC	
1	BANK1	TP	80	100	0	20	90	10	80	100	0	20	90	10	20
		OEIC													
2	BANK2	NITC	88.9	81.8	18.1	11.1	85.3	14.7	88.9	81.8	18.1	11.1	85.3	14.7	20
		OE01													
3	BANK3	NITC	100	76.9	23.1	0	88.5	11.5	100	76.9	23.1	0	88.5	11.5	20
4	ROWN	OESS	100	83.3	16.7	0	91.7	8.3	100	66.7	33.3	0	83.3	16.7	20
		OENB													
5	H01	TP	83.3	62.5	37.5	16.7	72.9	27.1	83.3	62.5	37.5	16.7	72.9	27.1	20
		TLSF													
6	TP	NITC	75	100	0	52	87.5	12.5	66.7	100	0	33.3	83.3	16.7	20
		OESS													

obtained in 1985. Again, managerial efficiency (OESS, OENB) was found significant for distinguishing bank ownership in 1986. OESS was significant at 1% level also in 1986. Technical partnership agreement and capital adequacy (TLSF) were significant at 10% level for distinguishing banks according to head-office location (HOL), in 1986, while the significant variables for distinguishing banks according to TP agreement were NITC and OESS. The FPR was 0% for ROWN and 16.7% for HOL, both in the resubstitution and crossvalidation results. The ability of the TP model worsened under the crossvalidation test.

In 1987, the logit forward selection analysis identified only managerial performance (OEOI) as the significant factor in distinguishing banks' performance. We see this in table 7.15. Both the variable and the equation were significant at 1% level going by the value of $Pr > X^2$. For BANK2 the significant factors were managerial efficiency (OETC) and capital adequacy (TLCLL) while they were capital adequacy (TLCLL), technical partnership agreement (TP) and head-office location (HOL) for BANK3. In BANK3 model, HOL was significant at 15% level while both TLCLL and TP were significant at 1% and 5% levels respectively. The entire models were significant at 1% level.

With respect to performance, as portrayed by the logit classification table, the BANK2 and BANK3 models performed better than the BANK1 model. While the former had zero value of FPR, the FPR for BANK1 was 12.5%. One out of the eight (8) vulnerable banks was wrongly classified as a resistant bank. Interestingly, one out of the eight (8) resistant banks was also wrongly classified as a vulnerable bank.

Another interesting development is observed from the resubstitution and cross-validation results for the models. The BANK1 model performed better than both the BANK2 and BANK3 models. Based on the resubstitution results, the FPR for BANK1 was 0%, 25% for BANK2 and 20% for BANK3. While only 90% of resistant banks were classified correctly as was the case also in the logit classification table, 100% of vulnerable banks were classified correctly compared with 87.5% obtained from the logit classification. The figure remained the same for the cross-

Table 7.15: Results of Logit Analysis of Bank Performance in 1987

[illegible]

Table 7.16 Assessment of the Classification Ability of Logit Model By Discriminant Classification Results for 1987

Eq	Class Var.	Selected Vars.	Resubstitution						Crossvalidation						N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC	
1	BANK1	OE01	100	90	10	0	95	5	100	90	10	0	95	5	20
2	BANK2	OE7C	75	100	0	25	87.5	12.5	75	100	0	25	87.5	12.5	19
		TLCIL													
3	BANK3	TLCIL													
		TP	80	100	0	20	90	10	60	92.9	7.1	40	76.4	23.6	19
		HOL													
4	ROWN	OE5S	92.9	83.3	16.7	7.1	88.1	11.9	92.9	83.3	16.7	7.1	88.1	11.9	20
5	HOL	TP													
		TDITD	75	85.7	14.3	25	80.4	19.6	75	57.1	42.9	25	66.1	33.9	19
		TLD													
		RBUB													
		TLCD													
6	TP	OE01	75	62.5	37.5	25	68.7	31.3	75	62.5	37.5	25	68.7	31.3	20
		HOL													

Table 7.17: Results of Logit Analysis of Bank Performance in 1988

[illegible]

Table 7.18: Assessment of the Classification Ability of Logit Model By Discriminant Classification Results for 1988

Eq	Class Var.	Selected Vars.	Resubstitution							Crossvalidation							N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC			
1	BANK1	OE01	100	100	0	0	100	0	100	80	20	0	90	10	20		
		TLCD															
2	BANK2	OE01	100	76.9	23.1	0	88.5	11.5	100	69.2	30.1	0	84.6	15.4	20		
3	BANK3	TP	100	100	0	0	100	0	100	100	0	0	100	0	20		
		OEPA															
4	ROWN	TTDNB	92.9	83.3	16.7	7.1	88.1	0	92.9	66.7	33.3	7.1	80	20	20		
		DVOI															
5	HOL	RATA															
		TLCL	100	100	0	0	100	0	91.7	100	0	8.3	95.8	4.2	19		
		CSCSD															
6	TP	OE01	100	100	0	0	100	0	75	100	0	25	87.5	12.5	20		
		HOL															

Table 7.19: Results of Logit Analysis of Bank Performance in 1989

[illegible]

validation results for BANK1. Indeed, overall, the BANK1 model remains a better one than the other models.

The FPR which had been zero for both BANK2 and BANK3 under the logit classification rose to 25% and 20% respectively, according to the resubstitution results. While the results remained the same for BANK2 under crossvalidation, the FPR doubled for BANK3. Based on the logit classification, the discriminant resubstitution and crossvalidation results, the model for BANK1 seems the best of the three models.

The variable OESS was still found to be the distinguishing factor with respect to bank ownership in 1987. Managerial efficiency (OEOI) and head-office location (HOL) were the distinguishing factors for technical partnership agreement. Both models had zero FPR going by the logit classification and this increased to 7.1% and 25% respectively for the resubstitution and crossvalidation results. A decline in the FNR was observed from the logit classification to the crossvalidation results.

Managerial efficiency was found significant for distinguishing bank performance in each of the classifications BANK1, BANK2, and BANK3. In each case the variable was significant at 1% level. In addition to OEOI, TLCD was found significant at 10% level for BANK1 while TP was significant at 1% level for BANK3. All these models were significant at 1% level. The logit classification results indicate correct classification of all vulnerable and resistant banks. The resubstitution results for BANK1 and BANK3 models also reflect correct classification of all banks. The FPR for BANK2 was also zero for the resubstitution and crossvalidation results just as it was for BANK1 and BANK2. The FNR for models BANK1 and BANK2 worsened in the crossvalidation results. The BANK3 model is such a perfect model in that it classified all banks correctly under the logit classification, resubstitution and crossvalidation results.

The significant variables identified for TP remained the same in 1988 as in 1987 (tables 7.17 and 7.18). Managerial efficiency (DVOI) still continued to be significant in distinguishing between predominantly public and predominantly private banks. TTDNB was also significant at 1%. The ROWN model is quite satisfactory

going by the FPR for the classification results. The HOL model also performed well. RATA, TLCLL and CSCSD are the significant variables for distinguishing banks by head-office location.

Again, the managerial efficiency variable OEOI was found significant in 1989 for the BANK1, BANK2 and BANK3 classification variables as we can observe from table 7.19. In addition to this variable, we have TCTA (capital adequacy) also significant at 1% level for BANK1, OETA significant for BANK2 at 5% level. The prob-value for the Score statistic was lower for BANK3 than for BANK2 which was also lower than that of BANK3. The logit classification results indicated that all the models are able to correctly classify all the banks. The model for BANK2 remained impressive going by the zero FPR for the resubstitution and crossvalidation results of the discriminant analysis as can be seen from table 7.20. Under both situations all banks were correctly classified. This development further indicates the significance of managerial efficiency according to classification variable BANK2.

The resubstitution results for BANK1 indicated 100% correct classification of all sample banks. The FPR rose to 20% under the crossvalidation results while the FNR still remained the same. The BANK3 model was not as impressive and credible as the others. While the resistant banks were correctly classified under the resubstitution analysis, the FPR was 33.3%. This is too high. The rate, infact, increased to 50% under the crossvalidation results.

The ROWN, HOL and TP all had FPR of 0% under the logistic classification, 0%, 8.3% and 41.7% respectively under the resubstitution analysis and 15.4%, 33.3% and 41.7% respectively under the crossvalidation analysis.

Table 7.21 presents a summary of the significant variables selected by the logit analysis over the study period. Technical partnership agreement significantly distinguished bank performance according to the classification variable BANK1 during the pre-SAP period. For BANK2, over this period NITC remained consistently significant. No such trend was observed for BANK3. Over the SAP period managerial performance represented by the ratio OEOI was found significant for distinguishing bank performance according to BANK1 classification. Indeed this

Table 7.20: Assessment of the Classification Ability of Logit Model By Discriminant Classification Results for 1989

Eq	Class Var.	Selected Vars.	Resubstitution						Crossvalidation						N
			SSY	SFY	FNR	FPR	CC	MC	SSY	SFY	FNR	FPR	CC	MC	
1	BANK1	TCTA	100	100	0	0	100	0	80	100	0	20	90	10	20
		OE01													
2	BANK2	OE01	100	100	0	0	100	0	100	100	0	0	100	0	20
		TTD													
3	BANK3	OE01	66.7	100	0	33.3	83.3	16.7	50	100	0	50	75	25	20
		TTD													
4	ROWN	DVOI	100	85.7	14.3	0	93	7	84.6	57.1	42.9	15.4	70.9	29.1	20
		RBUB													
		TTDNB													
5	HOL	RATA													
		TTDNB	91.7	87.5	12.5	8.3	89.6	10.4	66.7	37.5	62.5	33.3	52.1	47.9	20
		ROWN													
		TLCLL													
		LIOI													
6	TP	ROWN													
		OINB	58.3	100	0	41.7	79.2	20.8	58.3	50	50	41.7	54.2	45.8	20
		HOL													
		TDGD													

Table 7.21: Summary of Bank Performance Determinants Selected By the Logit Analysis

S. No.	Variable	1985	1986	1987	1988	1989
1	BANK1	TP	TP	OE01*	OE01*	TCTA*
		RATA	OETC*		TLCD	OE01*
2	BANK2	TP	NITC*	OETC*	OE01*	OE01*
		NITC	OE01*	TLCLL*		OETA
3	BANK3	OE01*	NITC*	TLCLL*	TP	OE01*
		TTD		TP	OERA	TTD
				HOL		
4	ROWN	OESS	OESS*	OESS*	TTDNB*	DVOI*
		TTD	OENB*		DVOI	RBUB
						TTDNB*
5	HOL	OE01*	TP	TP	RATA*	RATA*
		NITC	TLSF	TDTTD	TLCLL	TTDNB
		OITC		TLD	CSCSD	ROWN
		RBUB		RBUB		TLCLL
				TLCD		LIOI
6	TP	NISS*	NITC*	OE01*	OE01*	ROWN
			OESS*	HOL	HOL	OINB
						HOL
						TDCD

Note: The asterisked variables were also found significant by the univariate T-Test

has been the case since 1986, except in 1989 when the variable OETC was significant. The same was observed for BANK2. While only managerial performance was found significant in 1987 for BANK1, it was the only factor for BANK2 in 1988 and 1989. Between 1988 and 1989 the managerial efficiency factor was significant for BANK3.

A trend is observed also with respect to bank ownership. The variable OESS has been very significant over the period 1985 and 1987 while DVOI was significant in 1988 and 1989. These two variables still indicate managerial efficiency. TTDNB was significant also in 1988 and 1989.

In 1988 and 1989, risk and capital adequacy were identified as significant factors for distinguishing banks by head-office location. Risk is expressed by RATA while capital adequacy is expressed by TLCLL. We found that banks with Lagos head-offices had significantly higher average RATA than those having head office outside Lagos going by the univariate tests for 1988 and 1989. This was not the case for TLCLL.

Both managerial efficiency (OEOI) and head-office location (HOL) differentiate banks with technical partnership agreement from those without. The univariate tests in tables 6.36 and 6.37 confirm the significance of OEOI. In fact the ratio was significantly higher for banks without technical partners indicating they are less efficient.

The logistic and the discriminant analyses confirmed risk (RATA) as a factor distinguishing Nigerian commercial banks by location of head-office in 1988 and 1989. Finally, the ratio OEOI was also selected by both logit and discriminant selection analysis as being significant for classifying banks according to head-office location.

7.6 Conclusion

The analysis has served as a follow-up to the univariate analysis reported in chapter six. While the univariate analysis was able to identify individual factors which significantly differ for the two categories of banks (and therefore indicated factors significant for distinguishing such), the multivariate analyses (both discriminant and logit) were to identify the *combination of factors* which determine the performance of

Nigerian commercial banks. Further to this, the results of similar techniques adopted in this regard provided for an interesting comparison. The discriminant models' classification ability were further investigated by subjecting same to logit analysis and vice-versa.

Overall, we find that given the same *entry* and *staying* significance level, 15%, the discriminant analysis selects more variables than the logit selection analysis. The number of variables per model is two (2) for the logit models. Also, the discriminant models with high average squared canonical correlation (ASCC), seem more credible, based on the smaller false positive rates (FPR) for resubstitution and crossvalidation results than the logit models. The only discriminant model checked using the logit analysis was found to be highly credible going by the classification generated through it using logit analysis.

Both methods of analysis confirm that among all the factors considered, managerial efficiency is the most prominent for classifying banks by performance based on the different classification rules. The same factor distinguished banks by ownership over the study period though in addition to this has been the level of risk. The predominantly public banks are confirmed to be less efficient compared with predominantly private banks. Also, vulnerable banks are observed to be significantly less efficient than resistant banks. The predominantly-public banks also have had a lower value of DVOI compared with the other category of banks.

Also, in the last two periods of the SAP period, banks with head-office in Lagos had a higher proportion of risk assets than the other category of banks. Since the adoption of SAP, our analysis reveals that banks with technical partnership agreements were more efficient than those without. We should note however, that 61.5% of banks that are predominantly-publicly owned were without technical partnership agreements.

The discriminant models showed a tendency for a decline in classification ability as the performance criteria is relaxed; that is, as we move definition from BANK1 to BANK3. This was, however, not clear with the logit models. And perhaps to the extent that discriminant models performed creditably well even when subjected

to logit analysis while the logit models failed to live up to such similar expectation when subjected to discriminant analysis, the authenticity of this conclusion seems to be further enhanced. This is one observation that calls for further research.

Our comparison of logit with discriminant models in the manner in which it has been carried out can be said to have pointed to one possible method of determining and selecting a most appropriate model for the classification of banks by performance by the supervisory authorities. This is not readily observable in the conclusions in the literature. The discriminant models also performed extremely well when subjected to reclassification under the logit technique with the FPR declining considerably in many of the models. The logit models, when subjected to reclassification under the discriminant analysis technique, recorded FPRs higher than those under logit analysis. This conclusion is not in line with the claim that the different techniques are interchangeable in multiple choice regression analysis. It tends to show that where the response or group variable is a binary choice variable, the MDA proves to be a better technique. The same conclusion may not hold where the response variable is multiple in nature.

The results of our analysis also reveals no significant difference between the classification analysis of models based on the stepwise method compared with those based on the forward selection method, though as earlier mentioned the later confirmed our expectations regarding the inclusion of a greater number of variables into the model; a development which in most cases could be said to have accounted for the slight improvements in the ASCC associated with the full models. We do note, however, that this conclusion may not quite hold where a larger independent sample is adopted in assessing the classification ability of the model except, of course, in some cases where both selection procedures yielded exactly the same model.

The need for more rigorous analysis of bank performance determinants such as we have undertaken by the adoption of the multivariate techniques was further brought to light in our analysis. We found, for example, that while liquidity (via the ratio of total loans-to-total deposits was identified in combination with some other factors to be a significant factor distinguishing banks by head-office location, all

through the SAP era, the univariate analyses which sought to establish individual significance of factors, did not reveal any significant differences in the liquidity (TLD) between banks with different head-office locations. Hence, we observe in line with theoretical expectations that while a factor may be insufficient to capture the distinguishing characteristics between the groups of banks, it may be found helpful in combination with other factors. This further reveals the danger in excluding certain factors from the multivariate analyses simply because they were not found significant by the univariate analysis.

One notable characteristic of our analysis thus far is that we have, deliberately though, restricted our analysis to single year periods. This is informed by the fact that the considerable variations which have been observed within the financial sector especially over the study horizon, suggest that our analysis would make more meaning if we could capture these changes in the identification of bank performance factors. The results thus far have also confirmed this, as some factors identified to be significant in certain periods were observed to be insignificant in other periods.

We do recognise, however, that the rather small sample size upon which our analyses has been based poses quite a limitation to the universal applicability of our findings. Quite often, one way of tackling this limitation is to 'pool' the data by combining, for example, the data of the sample banks over several time periods. Based on this, our analyses can then be conducted. This technique has not been employed in this study, essentially due to our belief that it would tend to implicitly assume that the banks operated under about the same economic and regulatory environment over the period and perhaps also due to space constraints. The special factors which characterise the performance of banks in each of these periods could then be ignored. Furthermore, although the pooling of cross-sectional and time-series data increases the information available, and hence the efficiency of the estimates, several problems may arise (O'Keefe, 1992).² As a result, while noting the

² O'Keefe, J. (1992) *Bank Failure Resolutions: Implications for Banking Industry Structure, Conduct and Performance*, FDIC Banking Review, vol. 5, no. 1,

potentials of basing our analysis on pooled data, we also identify this as a good area for further research.

CHAPTER EIGHT

BANK VULNERABILITY AND RESISTANCE IN NIGERIA: AN APPRAISAL OF THE NATIONAL BANK

8.1 Introduction

In this chapter we critically examine the case of a bank in the Nigerian banking industry which has come closest to failing. It is believed to be a good example of a vulnerable bank both as may be perceived by an ordinary observer of events in the industry as well as by our three definitions. In addition to examining the financial state of the bank over the period 1980 to 1989, and especially in relation to the industry (sample) averages (between 1985 and 1989), we also pay close attention to the responses provided in the questionnaire which the bank completed. It is expected that the results which have been obtained in both the uni- and multivariate analyses will be further substantiated through this critical appraisal and comparison. In particular, the issues of bank ownership, managerial efficiency and head-office location as they relate to bank performance will be assessed. Next, we assess the trends in some financial variables of interest recorded by the Bank. This is followed by a discussion of key features of the survey responses from the Bank as well as the lessons which can be learnt from the experiences of the Bank both as revealed in the survey and as can be obtained from other formal and informal sources.

8.2 Trends in Relevant Financial Variables for National Bank: 1980 to 1989

The net income for the bank was only ₦2.71 million in 1980 with an asset base of ₦468.49 million. The net income declined by 58.3% by 1981 before increasing to ₦4.4 million in 1982 when the asset base was ₦620.09 million. Between 1983 and 1989, the available information as contained in table 8.1 reveals that net income before tax fluctuated though with a declining trend. Net income was a mere ₦0.09 million in 1987, a period in which the total assets had reached ₦1.04 billion. Going

Table 8.1: Financial Variables for National Bank of Nigeria (1980-1989)

S.No	Financial Variables	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	Total Loans	192.77	255.25	367.39	424.64	466.44	505.47	563.14	656.39	841.22	802.43
2	Agricultural Loans	na	na	39.96	38.41	57.11	na	99.37	na	146.14	175.87
3	Manufacturing Loans	na	na	126.24	133.64	164.64	na	191.83	na	294.40	361.09
4	Other Loans	na	na	201.19	252.59	244.68	na	271.95	na	400.69	536.96
5	Operating Expenses	na	30.43	47.80	67.67	73.59	79.21	84.87	105.27	144.06	176.81
6	Interest Expenses	na	0.18	0.45	3.11	3.21	1.83	1.20	3.42	3.61	6.01
7	Wages and Salaries	9.40	12.04	17.05	21.17	27.74	28.53	28.70	31.15	34.39	41.25
8	Other Expenses	na	18.22	30.31	43.39	42.64	48.85	54.98	70.69	106.06	129.55
9	Total Assets	468.49	533.71	620.09	733.98	805.25	902.38	886.11	1041.53	1471.50	1816.54
10	Risk Assets	440.20	365.09	471.94	571.91	628.10	745.36	776.87	839.16	1136.79	1296.37
11	Current Assets	28.29	26.88	25.69	55.55	44.30	47.80	48.92	53.49	136.88	520.17
12	Total Deposit	382.26	428.75	536.25	612.89	664.24	692.44	721.37	841.46	1185.34	1475.34
13	Time Deposit	82.49	83.20	123.77	115.23	212.08	215.81	163.80	255.51	412.48	369.16
14	Current Deposit	205.12	235.79	268.35	349.70	269.30	277.51	313.55	325.27	452.28	685.04
15	Savings Deposit	94.65	109.77	144.12	147.96	182.85	199.12	224.01	260.88	320.59	421.14
16	Other Deposit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	Total Capital	13.92	15.06	18.91	20.41	20.50	21.67	21.67	21.76	21.76	1.73
18	Shareholders' Funds	13.92	15.06	18.91	20.41	20.50	21.67	21.67	21.76	21.76	1.73
19	Bad Debt Provision	52.42	61.55	46.26	57.30	63.06	70.76	81.72	99.01	118.56	217.68
20	Total Reserves	3.92	5.06	8.91	10.41	10.5	11.67	11.76	11.76	11.76	195.85
21	Operating Income	35.33	37.89	63.25	75.14	75.48	83.42	88.01	108.49	148.69	194.51
22	Loan Income	18.35	19.61	32.89	46.80	50.96	56.24	60.64	70.84	99.56	119.83
23	Securities Income	4.97	4.06	5.70	5.64	5.86	9.73	10.30	7.85	12.06	8.89
24	Other Income	12.01	14.23	25.68	28.65	24.20	17.09	17.49	37.65	49.13	74.68
25	Govt. Secur. Holding	18.61	19.25	18.84	19.15	19.40	19.45	19.26	19.56	18.57	17.30

26	Other Borrowing	0.00	0.00	0.00	0.00	0.00	10.00	5.00	12.00	16.50
27	Cash Holding	21.21	38.35	79.40	30.13	32.21	21.62	20.79	22.58	52.49
28	Short-Term Assets	97.47	130.27	68.75	131.94	144.94	135.40	88.46	179.79	467.68
29	Net Income	2.71	1.13	4.40	1.43	0.10	1.17	na	0.09	-205.49
30	Dividend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	Staff Size	3803	4257	4177	3984	4040	3938	3804	3430	3483
32	Number of Branches	78	80	84	85	87	88	101	101	112

by the trend in bank profitability and total assets, it was obvious that the performance of the bank was declining significantly. Over the period 1981 to 1989, the average growth of the bank's assets during the pre-SAP period was about 15% which increased significantly during the SAP period to about 28%. The significant jump could have been boosted by the increase in inflation rate since the SAP period.

Over the ten year period, the return on assets for this bank was highest at 7.54% recorded in 1980. Indeed since 1984, the return on assets was less than 1%. The return on capital has been very high over the period. This, however, can only be truly assessed in the light of the adequacy of the bank's capital. The equity capital was ₦3.92 million in 1980, when the total assets was ₦465.49 million and the loan portfolio was ₦192.77 million. However, as in Table 8.2, average asset growth was about 15% between 1981 and 1986, while that of the loan portfolio was at least 10%. The growth in equity capital averaged 13% between 1981 and 1983 and barely changed between 1984 and 1988. The equity capital declined between 1988 and 1989 by 92.05%.

Relative to the industry average, the profitability ratios of the Bank were ridiculously low. The return on assets was just 0.47% in 1985, when the same averaged 1.96% for the sample of banks. This position hardly improved through the five-year period (1985 to 1989) in contrast with the industry trend. While the return on assets was 4.54%, on the average, for sample banks, it was for National Bank only 0.97%. Given this trend, it is obvious why the Bank was classified vulnerable over all the periods as was shown in Table 6.7.

The return on equity of the Bank, relative to the sample average was equally poor. Between 1985 and 1988, the Bank's return on equity was in the range of 14% to 22%. It jumped significantly between 1988 and 1989 due essentially to a 92.05% decline in its capital (Table 8.2). The average return on equity for the sample banks between 1985 and 1986 was about 60%, increasing to 81% between 1987 and 1988. For 1989, it was 133.79% (see Tables 6.1 - 6.5).

Quite obviously the bank was grossly under-capitalized. The credit exposure of the bank was in excess of 1000% of the equity capital over the 10 year period. In

Table 8.2: Growth of Selected Financial Indicators of National Bank of Nigeria (1981-1989)

S.No	Financial Variables	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	Total Loans	32.41%	43.93%	15.58%	9.84%	8.37%	11.41%	16.56%	28.16%	-4.61%
2	Agricultural loans	0.00%	0.00%	-3.88%	48.69%	-100.00%	0.00%	-100.00%	0.00%	20.34%
3	Manufacturing loans	0.00%	0.00%	5.86%	23.20%	-100.00%	0.00%	-100.00%	0.00%	22.65%
4	Other loans	0.00%	0.00%	25.55%	-3.13%	-100.00%	0.00%	-100.00%	0.00%	34.01%
5	Operating Expenses	0.00%	57.08%	41.57%	8.75%	7.64%	7.15%	24.04%	36.85%	22.73%
6	Interest Expenses	0.00%	150.00%	591.11%	3.22%	-42.99%	-34.43%	185.00%	5.56%	66.48%
7	Wages and Salaries	28.09%	41.61%	24.16%	31.03%	2.85%	0.60%	8.54%	10.40%	19.95%
8	Other Expenses	0.00%	66.36%	43.15%	-1.73%	14.56%	12.55%	28.57%	50.04%	22.15%
9	Total Assets	13.92%	16.18%	18.37%	9.71%	12.06%	-1.80%	17.54%	41.28%	23.45%
10	Risk Assets	-17.06%	29.27%	21.18%	9.82%	18.67%	4.23%	8.02%	35.47%	14.04%
11	Current Assets	-4.98%	-4.43%	116.23%	-20.25%	7.90%	2.34%	9.34%	155.90%	280.02%
12	Total Deposit	12.16%	25.07%	14.29%	8.38%	4.25%	4.18%	16.65%	40.87%	24.47%
13	Time Deposit	0.86%	48.76%	-6.90%	84.05%	1.76%	-24.10%	55.99%	61.43%	-10.50%
14	Current Deposit	14.95%	13.81%	30.31%	-22.99%	3.05%	12.99%	3.74%	39.05%	51.46%
15	Savings Deposit	15.97%	31.29%	2.66%	23.58%	8.90%	12.50%	16.46%	22.89%	31.36%
16	Other Deposit	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17	Total Capital	8.19%	25.56%	7.93%	0.44%	5.71%	0.00%	0.42%	0.00%	-92.05%
18	Shareholders' Funds	8.19%	25.56%	7.93%	0.44%	5.71%	0.00%	0.42%	0.00%	-92.05%
19	Bad Debt Provision	17.42%	-24.84%	23.87%	10.05%	12.21%	15.49%	21.16%	19.75%	83.60%
20	Total Reserves	29.08%	76.09%	16.84%	0.86%	11.14%	0.77%	0.00%	0.00%	1565.39%
21	Operating income	7.25%	66.93%	18.80%	0.45%	10.52%	5.50%	23.27%	37.05%	30.82%
22	Loan Income	6.87%	67.72%	42.29%	8.89%	10.36%	7.82%	16.82%	40.54%	20.36%
23	Securities Income	-18.31%	40.39%	-1.05%	3.90%	66.04%	5.86%	-23.79%	53.63%	-26.29%
24	Other Income	18.48%	80.46%	11.57%	-15.53%	-29.38%	2.34%	115.27%	30.49%	52.00%
25	Govt. Secur. Holding	3.44%	-2.13%	1.65%	1.31%	0.26%	-0.98%	1.56%	-5.06%	-6.84%

26	Other Borrowing	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-50.00%	140.00%	37.50%
27	Cash Holding	80.81%	107.04%	-62.05%	6.90%	-32.84%	-3.84%	8.61%	23.78%	87.80%
28	Short-Term Assets	33.65%	-47.22%	91.91%	9.85%	-6.58%	-34.67%	103.24%	70.63%	52.45%
29	Net Income	-58.30%	289.38%	-67.50%	-93.01%	1070.00%	-100.00%	0.00%	-100.00%	0.00%
30	Dividend	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31	Staff Size	11.94%	-1.84%	-4.62%	1.41%	-2.52%	-3.40%	-9.83%	-0.90%	2.47%
32	Number of Branches	2.56%	5.00%	1.19%	2.35%	1.15%	14.77%	0.00%	2.97%	7.69%

fact, this grew to as high as 46383.2% in 1989. Between 1985 and 1989, the ratio grew from 2332.58% to 46383.2%. The sample average on the other hand grew steadily from 1329.2% in 1985 to 1946.34% in 1987 and again to 2876.3% in 1989. At all times the Bank's position was considerably poor when compared with the industry. Also going by the capital-asset ratio one also confirms that the bank had since 1980 been under-capitalized relative to the industry. This ratio has been largely under 3% over the 10-year period, having declined consistently from 2.4% to 0.1% over the last five years. Indeed, it fell during the SAP period compared with the pre-SAP period, showing only 0.1% in 1989. The industry average pre-SAP of 4.94% declined slightly to 4.86% over the SAP period (Table 6.6).

Sinkey and Walker (1977) defined an interesting capital adequacy ratio which was found in their study to be a significant determinant of bank performance. This is the ratio of total loans to the addition of equity capital and loan loss provision (TLCLL). For National Bank this ratio has been over 280% between 1980 and 1981, averaged 546% between 1982 and 1988 and was 365.72% in 1989. This trend is in line with the industry trend. The ratio averaged 582.75% in 1985 and increased to 698.96% in 1987 before declining steadily to 389.92% in 1989. The loan loss provision made by the bank in respect of a loan portfolio of ₦192.77 million in 1980 was ₦52.42 million, indicating a 27.2% provision. This reveals the quality of the assets of this bank as at 1980. The provision far exceeds what was the industry average at the time. Though the loan portfolio increased, the loan loss provision also increased at a slower pace. Consequently, the loan loss proportion (LLTL) declined consistently to 12.5% in 1982, averaged 14% between 1983 and 1988 before jumping significantly to 27.13% in 1989. For the industry, this ratio was 8.84% in 1985, rising to 9.91% in 1987 after declining slightly in 1986. Since this period, it grew steadily reaching as high as 16.96% in 1989. The decline in the loan loss provision between 1980 and 1988 should not be seen as an indication of an improvement in the quality of assets. We found indeed, over this period, an increase in the Bank's risk assets as a proportion of total assets. This rose from 25.33% in 1980 to 87.67% in 1986. Interestingly, the provision against non-performing assets was greater as a proportion

in 1980 when the proportion of risk assets was lower. Since 1987 the risk assets proportion has been on the decline reaching 71.36% by 1989, perhaps in a conscious attempt to improve the bank's poor liquidity position. The industry averages were 69.27% and 61.71% over both the pre-SAP and SAP periods.

In this regard we find from Table 8.3 that cash and short-term funds as a proportion of total assets (CSTA) increased consistently from 12.33% in 1986 when the liquidity position was lowest, to 28.64% in 1989. Over the same period the industry ratio increased from 32.93% to about 41%. It is interesting to observe that as a proportion of total assets, government securities holding of the Bank has really been on the decline since 1980 and moreso since 1987. Infact, it was only 0.95% in 1989. The development since 1987 is largely a result of the unattractive return on government securities. This seems in line with industry trend as the ratio averaged 14.76% and 9.32% respectively over the SAP and pre-SAP periods.

Also, measured by the loan-to-deposit ratio the bank could be seen to have grown increasingly less liquid between 1980 and 1987. The ratio increased from 50.43% to 78.97% over the period. The degree of liquidity for the Bank has been quite low in particular as from 1982. Both the loan-to-deposit (TLD) and risk assets ratio had been over 70%. From Tables 6.8 to 6.21 we find that the average loan-to-deposit ratio for resistant banks based on the three different classifications for the period 1987 and 1989 was about 50% while the overall sample average was 53.43%. For National Bank the ratio averaged 74% between 1987 and 1988 before improving to 54.39% in 1989. This development is known to be a result of an attempt by the bank's new management in 1989 to improve the liquidity of the bank. The bank had been expelled from the clearing house in 1989, due to the poor state of its liquidity.

With respect to managerial efficiency, National Bank, from the ratio of operating expenses to operating income, OEOI, is grossly inefficient. Between 1981 and 1989 the ratio had been as low as 80.3% and as high as 97.5%. This ratio has averaged about 55-60% for resistant banks according to the various performance classifications. On the other hand, the industry average was 73.45% over the SAP period. The same conclusion is reached when the Bank's ratio of operating expenses

Table 8.3: Trends in Selected Financial Ratios for National Bank of Nigeria (1980-1989)

S.No	Financial Ratios	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	Net Income/Asset	7.54%	1.40%	2.49%	1.02%	0.23%	0.47%	0.35%	0.31%	0.31%	0.97%
2	Net Income/Equity	253.81%	49.54%	81.70%	36.60%	9.22%	19.43%	14.49%	14.80%	21.28%	1023.12%
3	Net Income/Staff	0.009	0.002	0.004	0.002	0.000	0.001	0.001	0.001	0.001	0.005
4	Net Income/Branch	0.453	0.093	0.184	0.088	0.022	0.048	0.031	0.032	0.045	0.158
5	Loan/Deposit	50.43%	59.53%	68.51%	69.28%	70.22%	73.00%	78.07%	78.01%	70.97%	54.39%
6	CSTA	25.33%	31.59%	23.89%	22.08%	22.00%	17.40%	12.33%	19.43%	22.75%	28.64%
7	GSTA	3.97%	3.61%	3.04%	2.61%	2.41%	2.16%	2.17%	1.88%	1.26%	0.95%
8	Equity/Assets	2.97%	2.82%	3.05%	2.78%	2.55%	2.40%	2.45%	2.09%	1.48%	0.10%
9	Loans/Equity	1384.84%	1694.89%	1942.83%	2080.55%	2275.32%	2332.58%	2598.71%	3016.50%	3865.90%	46383.24%
10	Equity/Risk Assets	3.16%	4.13%	4.01%	3.57%	3.26%	2.91%	2.79%	2.59%	1.91%	0.13%
11	TLC/L	290.58%	333.18%	563.74%	546.44%	558.21%	546.87%	544.68%	543.50%	599.50%	365.72%
12	Loans/Assets	41.15%	47.83%	59.25%	57.85%	57.92%	56.02%	63.55%	63.02%	57.17%	44.17%
13	LT/L	27.19%	24.11%	12.59%	13.49%	13.52%	14.00%	14.51%	15.08%	14.09%	27.13%
14	RATA	93.96%	68.41%	76.11%	77.92%	78.00%	82.60%	87.67%	80.57%	77.25%	71.36%
15	CATA	6.04%	5.04%	4.14%	7.57%	5.50%	5.30%	5.52%	5.14%	9.30%	28.64%
16	LLOE	0.00%	202.27%	96.78%	84.68%	85.69%	89.33%	96.29%	94.05%	82.30%	123.12%
17	OE/OI	0.00%	80.31%	75.57%	90.06%	97.50%	94.95%	96.43%	97.03%	96.89%	90.90%
18	OETA	0.00%	5.70%	7.71%	9.22%	9.14%	8.78%	9.58%	10.11%	9.79%	9.73%
19	OETC	0.00%	202.06%	252.78%	331.55%	358.98%	365.53%	391.65%	483.78%	662.04%	10220.23%
20	OE/RA	0.00%	8.33%	10.13%	11.83%	11.72%	10.63%	10.92%	12.54%	12.67%	13.64%
21	OESS	0.000	0.007	0.011	0.017	0.018	0.020	0.022	0.031	0.042	0.051
22	OENB	0.000	0.380	0.569	0.796	0.846	0.900	0.840	1.042	1.385	1.579
23	Time/Current Deposit	40.22%	35.29%	46.12%	32.95%	78.75%	77.77%	52.24%	78.55%	91.20%	53.89%
24	Loan Income/Total	51.94%	51.76%	52.00%	62.28%	67.51%	67.42%	68.90%	65.30%	66.96%	61.61%

25	Deposit/Branch	4.901	19.250	18.840	19.150	19.400	19.450	19.260	19.560	18.570	17.300
26	Deposit/Staff	0.101	0.101	0.128	0.154	0.164	0.176	0.190	0.245	0.349	0.424

to total assets is examined relative to the industry average. Since 1983, the Bank's ratio has rarely been lower than 9.14%, reaching 10.11% in 1987 only to decline consistently over the next two years to 9.73% in 1989. The industry average for the ratio was 6.61% and 9.49% over the pre-SAP and SAP periods respectively. More specifically, the industry average was 6.56% in 1985 and it has increased steadily reaching 12.61% in 1989. National Bank's performance in this regard exceeded the industry average only in 1989. It would be observed that such improvements as this only began to show as steps were being taken to rescue it from problems.

The bank's cost structure does not portray it as a high cost bank. We observe that the bank had on the average about 40 kobo of time deposit for every N1 of current deposit between 1980 and 1983. This averaged about 78 kobo between 1984 and 1988 before it again declined to almost 54 kobo in 1989. At this time current deposit were *free funds*. The situation has changed since 1990 with the monetary authorities' directive that banks pay interest on this category of deposits. Again, a look at the industry average revealed that the deposit composition of National Bank was low cost in nature. Over the pre-SAP and SAP periods, the industry average was N1.26 kobo and N1.38 kobo of time deposit for every N1 of current deposit. Over the 10-year period, time deposit (high cost funds) as a proportion of total deposits was at most 34.8% while the same was about 37% for the industry between 1985 and 1989. The substantial advantage of the Bank as revealed by the current deposit bias compared to the industry performance seemed to have been more than offset by the other components of deposits - savings & other; given the similarity in the ratio of time deposits to total bank deposits over the first five years. The unimpressive performance of National Bank does not seem to have been positively associated with the bank's cost structure. The major problem has been with the low quality of the bank's assets, managerial inefficiency, illiquidity and the low and seemingly unreasonable level of provision for loan losses. We also find that the level of risk in the asset portfolio was unduly high. A comparison with industry average under all performance criteria clearly reveals that the Bank performed well below average.

8.3 Some Lessons from the Survey Responses and Experiences of National Bank

National Bank represents the first surviving indigenous bank, having been set up in 1933. The bank, with head-office in Lagos, is owned by the governments of Oyo, Ogun and Ondo states, and only recently, Osun state. Indeed, they own 99.8% of the bank. This has been the case since 1980 and prior to this time. The bank has never engaged technical partners since it was established.¹

Due to the liquidity crisis that had rocked the bank since 1988, the board of the bank was dissolved by the owner governments. The owners engaged a firm of management consultants to take over its management and terminated the appointment of a number of top management staff. Prior to this time, the government, by virtue of its ownership of the bank, had changed the board and management of the bank at will, and also rather frequently. The study questionnaire for this case bank was apparently completed by a management which was essentially external to the bank. The responses in the questionnaire, being very comprehensive, indicate quite positively, the factors observed to have brought trouble for the bank.

The response to the questionnaire indicated that capital adequacy, asset quality, managerial performance, loan portfolio, liquidity, revenue sources, revenue application, ownership and number and distribution of branches were major determinants of bank performance. It is necessary, as one discusses the responses made by this bank, to bear in mind that they are really based on the findings of the *interim* management and to address them as such.

The survey response from the bank not only indicated that the ownership of the bank is a major determinant of bank performance, among the identified factors, it indicates that the ownership factor is the most significant. Managerial performance is seen to be second to the ownership factor in the significance of the factors followed by liquidity. We had identified in section 8.2 that the managerial

¹ It is worthy of note, however, that arising from the owners' perception of the state of the Bank, Messrs Akintola Williams & Co. (Chartered Accountants) were engaged as technical managers of the Bank. This was however at the early stages of its crises, about 1989.

performance of the bank was very poor while the level of liquidity had been quite low absolutely, and in comparison with the industry average. Managerial performance really is related to ownership as the National Bank situation exemplifies.

In the response, it was not clearly stated whether the cash ratio, liquidity ratio, and capital adequacy ratio, if consistently violated, would eventually lead to bank failure or at least dismal performance. In response to the extent of adherence to some of these CBN guidelines, we find that National Bank violated the credit expansion ceiling consistently between 1985 and 1988, after having done so way back in 1981. The indigenous credit allocation stipulation has been adhered to. This CBN policy states the minimum proportion of aggregate bank credit that should go to indigenous borrowers. The Bank was set up in 1933 to provide credit to indigenous businesses when it was observed that the foreign owned banks which existed prior to the time were clearly biased towards foreign businesses in the administration of credit. The Bank has since stuck to this positive objective.

The adverse aspect of their commitment to this goal is the fact that the Bank is widely known to have been unmindful of the *ability or willingness* of the indigenous borrowers to repay the loans. Its credit decisions had been motivated more by factors other than economic. There have been reports that the Bank's managers refuse or accept to grant facilities depending on what private benefits would accrue to them prior to disbursement of such facilities rather than on the economic viability of the project. The quality of the bank's assets has thus been very poor, yet successive managements failed to tackle the problem and continued to make inadequate provisions for bad and doubtful debts. This is known to have been the case with the Bank's adherence to small scale credit and rural credit policy stipulations respectively, of the CBN. The small scale credit policy stipulates that a bank must allocate a minimum proportion of indigenous credit to small scale business while the rural credit policy stipulates that banks should apply a minimum proportion of rural deposits mobilized to the same rural areas as credit. The bank had also performed creditably in this area. It is known also that many banks have violated these policy stipulations due to the high rate of default associated with small-scale

and rural (mostly agricultural) credit. Adherence to these credit stipulations has the potential effect of lowering the quality of assets of a typical Nigerian commercial bank.

Between 1980 and 1985, National Bank just barely satisfied the monetary authorities' liquidity ratio requirement. Since 1986 the bank consistently violated the stipulated liquidity ratio. The trend with regard to the bank's attempt to adhere to the liquidity ratio reveals the difficulty it has been having as far back as 1980.

One observation from the assessment of the bank's adherence to CBN stipulations is that adherence to the credit guidelines could weaken the asset quality of the bank if not handled with care, while non-adherence to the liquidity ratio could lead to financial crisis. These two factors were largely the case for National Bank. It is in this light that the bank's response indicated that liquidity and capital adequacy ratios are CBN's guidelines that are beneficial to commercial bank performance.

The survey responses with respect to the factors believed to be most important in signalling possible bank failure (and increasing the chances of dismal performance) was also found to be quite interesting. It is believed that the most evident signal of impending bank failure is shortage of cash and short-term funds (liquidity) to meet customer's regular demands. The management's response indicated that this situation can be corrected and indeed prevented by improved managerial efficiency. Efficient management of resources and loans by ensuring regular matching of loans tenor with that of deposit liabilities are important, while good asset quality and adequate capital, on which the bank can fall in case of need to raise necessary funds, are also essential. The bank, from our analysis in section 8.2 was shown to have had problems in these various areas.

Explaining the circumstances under which it is believed that a bank could fail, the questionnaire response emphasized the board and management factor. It identifies that a bank could fail if there is improper discharge of its normal day to day running of the bank, as well as if and when there is lack of integrity within the composition of either the board or top management team. Other factors indicated include: disregard for banking guidelines, bad fund management, violation of banking

regulations, lack of integrity on the part of the key bank personnel, low number and quality of professional staff and general staff indiscipline. It is widely believed that this has been the situation at National Bank for quite sometime.

Of all the problems or factors that led to the fall of National Bank, that relating to the frequency of change and composition of management and the board remains the most prominent factor. In fact, it seems to have led to the other problems. The fact is that since inception it has been government owned, the board and consequently the management, has changed with the same frequency at which the government changed. On one hand, whenever any of the Governors of the four owner states changed, that would almost certainly lead to a dissolution of the bank's board.² Each governor or government would want to put a new representative on the board. On the other hand when the state commissioners are changed even by the same state government, the board changes since all the finance commissioners of the three states automatically become members of the board with one serving as chairman. The frequency of change hampered policy continuity a great deal. Usually the new board members would come on stream with different motives altogether. Only very few, if indeed any, of the members had the progress of the bank at heart.

In line with this view is the addendum on board of directors provided to the questionnaire. It is believed that this addendum was felt necessary by the new management simply to re-emphasize the board problem as being an overriding problem. It is stated in this addendum that *there must be a reflection of self-esteem and reasonable contentment with what (material and financial resources) the generality of the board members already have, to ensure that, by and large, they would be there (on the board) to serve the bank and not for the financial benefits rendered, or to take advantage of the fringe benefits and other privileges, offered or solicited, which may be associated with the position.* Additionally, it has been indicated that the board composition hardly reflected a good mix of diverse and practical background of members in

² The position of the Managing Director was politicised and made almost rotational among the owner states.

finance, economics, law, business management experience as well as banking. Also the board of such banks usually have been known to have an overbearing influence on the management. There are in fact cases in which the managing director of the bank could be directly removed by the state government. Such acts have the potential of promoting managerial inefficiency as efforts will be made by managers to acquire as much financial benefits as they possibly can since they could be removed, particularly from key positions, at any time.

Consistent with this orientation is a widely acknowledged report that loan officers and branch managers of the bank took a percentage of the credit facilities provided to customers. Whoever was not going to play along seemingly was not in need of credit. This practice purportedly led to a situation in the bank in which staff competed vigorously to be at the branch. Also, there are reports of loan applications which were not credible that were approved with managers exceeding their credit limits with impunity. The level of indiscipline among the staff was high. When the asset base grew, the level of risk assets also grew considerably thus lowering its liquidity as the quality of the assets also declined. It was not surprising that the bank could not embark upon effective debt recovery due to the fact that borrowers requested the branch managers to first pay back the percentage they had earlier collected having been (indirect) beneficiaries of the same credit facilities.

The Bank's response indicated that there was enough time for the situation to be corrected rather than for it to be allowed to degenerate to the point of total failure, if owner governments had taken appropriate remedial action. The unfortunate development was also blamed on the inability of the monetary authorities to correctly diagnose the crucial problems in good time. In this case it is believed that the CBN could have directed and supervised the control and management of the bank to ensure good results. The failure of the CBN to take control could perhaps be explained by the fact that the bank had and still has considerable government influence on both its board and management. From our analysis, the bank's position in 1980 was not impressive and one would have expected that something would have been done about it particularly knowing that the bank had such comprehensive and

revealing quantitative information as it provided.³ The situation deteriorated to such an extent that in 1987 its net income was a mere N90,000 with an asset base of N656.39 million. Other banks with similar asset portfolio made profit in the tens of millions about the same period.

The problem of the board and management is not only limited to National Bank. In Nigeria, the trend is similar among all the wholly state government owned banks. Recently, similar situations have been experienced in other state owned banks. There have been incessant clashes between the board and management of these banks. In recent times these have become worse as both strived to have control over the allocation of foreign exchange which had become very profitable both for the banks and individuals. These clashes are affecting many of these Banks. The same problem is already rearing its ugly head among privately-owned newly licensed banks. Quite a number of these banks are owned by a small group of individuals who being members of the board seek almost total control over the banks' management. Many managing directors have been made more of figure heads with little or no management discretionary power while some non-executive chairmen have suddenly assumed executive responsibilities. A number of cases are pending in the courts presently on bank ownership, board composition and between the board and management of some banks. Above all other factors that could threaten the corporate existence of a bank in the future in Nigeria, with the influx of new banks, the appointment, composition and stability of the board and its relationship with the management are rated the highest. A case was reported recently which degenerated into physical assault between a board chairman and his managing director/chief executive leading to hospitalisation of the latter!

³ It is necessary to state in this regard that the degree of comprehensiveness was achieved as a result of the author's personal relationship with the head of the technical management team which provided the information coupled with his interest in the focus and outcome of this study.

8.4 Conclusion

We have examined aspects of the financials of National Bank which is a Nigerian commercial bank on the brink of collapse. The trend in the financials, respectively, going by the ratios, revealed among others, the poor financial state that the Bank has been in since the early '80s. In comparison with industry averages (assumed to be the average of sample banks), the Bank's performance has been consistently below average. It has been shown to be considerably less profitable, less liquid, managerially inefficient as well as possessing a low quality of assets. The low profitability coupled with the lack of managerial intuition and direction as well as the sheer magnitude and low quality of its assets has left it highly under-capitalised in the 80s. The quality of assets has been accounted for by the conflict of corporate objectives with individual objectives and the seemingly over-zealous attitude towards providing credit for domestic clients and businesses, and even to state government socially-oriented projects under the auspices of its owner states.

Our discussion has also revealed the critical nature of board and management to the performance of a commercial bank. The peculiarities of the typical developing economy in which political, social and individual persuasions override economic considerations in board and management composition as well as in the evaluation of credit have been emphasized. This fact would seem to hold irrespective of the type of government, civilian or military.

In model reclassifications, especially with the logit models which were further assessed under the resubstitution and crossvalidation analysis associated with discriminant analysis, the Bank was consistently correctly classified as a vulnerable Bank. The same was the case with discriminant model classifications. We also recall in this regard that this model performed extremely well when assessed under the logit resubstitution analysis. In essence, the models captured the essential determining factors which, as our discussions have revealed, are peculiar also to National Bank.

In all, the National Bank case further confirms that in a typical developing economy, managerial efficiency, liquidity, capital adequacy, ownership structure, and asset quality are the most significant determinants of commercial bank performance.

CHAPTER NINE

SUMMARY, CONCLUSIONS AND SOME RECOMMENDATIONS

9.1 Summary

This study has attempted to identify significant factors, both financial and otherwise, that determine the performance of commercial banks in a typical developing economy. In particular, we have used Nigeria as our case study.

The study concentrated on the commercial banks that existed as at 1985 just prior to the adoption of the Structural Adjustment Programme (SAP). A sample of twenty-four (24) Nigerian commercial banks was used while the questionnaire approach was adopted to collect the relevant quantitative information in addition to other qualitative information that bordered, among others, on the factors that banks believed to be the most significant determinants of bank performance and their perceived relationship with bank performance. We also sought respondents' views on whether or not the CBN should help protect banks and prevent bank failures, on the policies of CBN that are believed to be beneficial to and those detrimental to bank performance as well as on whether or not the financial deregulation which has brought about a significant increase of new entrants into the banking industry would result in bank failure,

Based on the quantitative information obtained, a list of ratios were compiled and computed for assessing the trends in the financial position of the banks relative to the industry performance. Also, this was used to evolve a definition or criterion for classifying banks into the Vulnerable and Resistant performance categories respectively.

For robustness in the analysis and greater insight into bank performance determinants in Nigeria, three different criteria were used for each period of the analysis. First, we defined as Resistant banks only those whose return on assets exceeded the median return on assets for all the banks. The second, stipulated as the resistant banks those with return on assets in excess of 80% of median return on

assets while the proportion used in defining the third criterion was 50%. The second definition tallies with that of Hunter and Srinivasan (1990).

A univariate test was carried out for each of the different performance classifications and involving all the thirty seven (37) financial ratios designed as a first stage analysis to identify which factor or group of factors were significant in distinguishing between the classes of banks. The significance tests were conducted at 5%, 10% and 15% levels.

Following this, both the logit and the discriminant techniques respectively were employed as a form of secondary and confirmatory analysis to consider and assess the adequacy models for discriminating or distinguishing vulnerable and resistant banks according to each of the three classifications. The validity or better still the classification ability of these models were checked and cross-checked using the classification option of the logit analysis as well as both the resubstitution and crossvalidation options available for assessing the performance of discriminant models (Lachenbruch and Mickey, 1968). The discriminant models were tried out using logit analysis while the logit models were also validated using discriminant analysis.

Finally, we undertook a case analysis of National Bank which is widely acknowledged within the industry as perhaps the most vulnerable of all banks in Nigeria today. This was undertaken with a view to assessing and perhaps confirming the significance of the factors earlier selected by the regression analyses approach and perhaps also to confirm the existence of other non-financial factors which significantly affect bank performance such as ownership, board and management composition.

The univariate analyses as well as both the logit and discriminant analyses respectively were conducted to identify factors that distinguish banks by ownership, head-office location and existence or non-existence of technical partnership agreements. The analyses was conducted to identify the major characteristics distinguishing between the categories of banks and also to confirm or refute such claims as that made recently by the management of one of the sample banks, which suggested that the performance (profitability) of banks with head-office in Lagos was better than those based outside Lagos.

The conclusions of our various analyses are highlighted in the section that follows. In addition, we deemed it necessary to make some recommendations emanating from the study's conclusions and the study's limitations. Finally, some suggestions for further studies are made.

9.2 Conclusions

The conclusions that can be drawn based on the results obtained in this study are stated in what follows:

1. The study results revealed that, of the twelve (12) groups of factors listed five were deemed by the majority of respondent banks to be the major factors determining banks' performance in Nigeria. These factors include capital adequacy, asset quality, managerial efficiency, loan portfolio and liquidity. All these factors except capital adequacy were also indicated by the majority to be positively correlated with bank performance. This implies for example that an improvement in asset quality has the effect of improving bank performance in Nigeria.

2. The industry ranking of these factors in terms of their importance, as obtained from the responses, put managerial efficiency as the most important followed by asset quality, liquidity and capital adequacy. It is noteworthy that the same ultimate conclusion was reached in the studies conducted by the Comptroller of the Currency in the United States (Clarke, 1988).¹

The significance of liquidity and capital adequacy to bank performance was also confirmed from the indication that the consistent violation by banks, of the cash, liquidity and capital adequacy ratios prescribed by the monetary authorities, could promote dismal bank performance. These policy stipulations were also largely accepted as beneficial for bank performance in Nigeria. Among the policies believed

¹ See Clarke, R.L. (1988) "Banking in Troubled Times: What Hurts? What Helps?" Paper presented by the Comptroller of the Currency at ABA's Stonier Graduate School of Banking, June 20.

by the majority of operating banks to be detrimental to bank performance include: (i) the liquidity mop-up operation, (ii) the aggregate credit ceiling, (iii) the rural banking policy and (iv) the sectoral credit allocation policy.

3. The response of the banks with regard to the possibility of bank failures as a consequence of the influx of new banks was not conclusive. The major points indicated among others include the fact that:

- (a) the industry still has room for more banks as some respondents believed there are unexploited opportunities and unsatisfied demand;
- (b) the influx will improve efficiency in service delivery which may not necessarily lead to failure; and
- (c) rather than explicit failures, what may result could be mergers or acquisitions.

Those who indicated these as possibilities used the overriding argument that only a phased programme for licensing new banks which will ensure adequate supervision and monitoring as well as allow for consolidation of the banks' positions can help reduce the risk of failure. This view is supported and in fact further amplified by Snoek (1988) in a discussion of the problems of bank supervision in developing countries, especially those implementing financial reform programs such as in Nigeria.² A need to reduce or do something about the incessant clashes between the board and management of banks, if failure is to be forestalled, was also emphasized in the survey results.

4. The discriminant analysis indicated that during the pre-SAP period the existence or non-existence of technical partnership agreements in banks was significant in determining the banks' performance.

According to the first criterion, managerial efficiency was found significant all

² Snoek, H. (1988) " Problems of Bank Supervision in Developing Countries" Paper presented at the IMF Central Banking Seminar, November.

through the study period, 1985 to 1989; risk was found to be significant in addition between 1987 and 1989; liquidity was significant along with capital adequacy between 1988 and 1989. Both managerial efficiency and capital adequacy were also found significant over the SAP period based on both the second and third performance classification criteria. The significance of risk during the era of deregulation was also concluded in the study of Pantallone and Platt (1987), whose analysis was based on the logit technique.

In essence, managerial efficiency ranked prominent among the factors and over the criteria, in addition to capital adequacy and risk. The ratio of operating expenses to operating income (OEOI) was the most prominent among managerial efficiency ratios used. This finding agrees with the conclusions of Meyer and Pifer (1970), Sinkey (1975) and Pettway and Sinkey (1980). Meyer and Pifer's study was based on U.S. commercial banks and multiple regression analysis. Sinkey focused on 110 samples each of problem and control (non-problem) U.S. commercial banks. He applied both univariate and multivariate discriminant analysis to the period between 1969 and 1972. Both techniques of analysis found the ratio of operating expenses to operating income (and indeed, managerial efficiency) as a significant performance determinant. Pettway and Sinkey's (1980) two-variable MDA classification model applied to 33 failed U.S. banks and 33 control banks also exhibited the significance of the ratio of operating expenses to operating income. Stuhr and van Wicklen (1974) found as the most important of three managerial efficiency variables, the ratio of net operating income to assets. Pantallone and Platt is a notable study which does not acknowledge the significance of managerial efficiency as a determinant of commercial bank performance. It is important to note that the study did not include among its managerial efficiency ratios, OEOI, a ratio which is very widely accepted and used for assessing managerial efficiency. Their ratios were relatively unpopular. We have used a more comprehensive set of ratios (37) incorporating a number of popular ratios from the literature in addition to our own inclusions, some of which are aimed at capturing the peculiarities of developing economies. Additionally, a more comprehensive set of tools have been used to establish the significance of these

variables. Extensive reclassification aimed at assessing the adequacy of the models and by implication, the individual ratios and combinations of the same have been conducted.

Capital adequacy is supported by Sinkey (1975) and Hunter and Srinivasan (1990). Of particular note is a similar conclusion made by Pantallone and Platt (1987) in a post deregulation study. The specific capital ratio commonly identified is the capital-asset ratio.

5. The discriminant analysis also indicated that managerial efficiency, bank size and asset quality were the most prominent combination of factors that distinguished predominantly public banks from predominantly private banks. Specifically, the univariate analyses indicated that the public banks which had lower quality of assets also were less efficient.

During the SAP period, the analysis selected liquidity and risk factors as best characteristics that distinguished banks with different head-office locations. Specifically also, banks with head-office outside Lagos were less liquid and had higher proportion of risk assets than banks with their head-office in Lagos. Perhaps as a result of the greater opportunities available in the capital city, banks carried above normal risks.

Profitability, bank size, managerial efficiency and risk were major characteristic factors that distinguished banks with technical partners from those without. Those with technical partners were observed to be significantly more profitable than those without. Our conclusions in this regard can hardly be compared with those of other studies. They are peculiar to the Nigerian banking system as an example of a developing country banking system.

6. The logit analysis generally selected fewer number of variables at the same significant entry level than the discriminant analysis. Based on the first classification criterion the logit analysis selected both the technical partnership and managerial efficiency factors as being the most significant for distinguishing between bank

performance. While the technical partnership factor was significant during the pre-SAP period, managerial efficiency has been significant both in the pre-SAP and SAP periods. Managerial efficiency remained the significant factor according to both the second and third classification criteria over the entire study period. While this conclusion, is in line with the popular conclusion of many similar studies, it differs from that of a similar study (Pantallone and Platt, 1987) which also adopted logit analysis. In the study, profitability (net income to total assets), capital adequacy (capital/assets), loan volume (commercial and industrial loans to total loans) and risk (loans/assets) were identified as significant factors.

7. Logit analysis revealed that only managerial efficiency distinguished between predominantly public banks and predominantly private banks. Risk and capital adequacy were significant factors, going by the results of the logit analysis, for distinguishing between banks with head-office located in Lagos and those without over the period 1988 and 1989. Over the SAP period, managerial efficiency made the difference between banks with technical partners and those without.

8. Both the discriminant and logit analyses results confirm managerial efficiency as the overriding factor that distinguished vulnerable from resistant banks irrespective of the performance classification criterion adopted. Going by the first criterion, capital adequacy was also confirmed significant in 1989. It is noteworthy that at this time the adequacy of banks' capital had begun to attract significantly the attention of monetary authorities.

The different types of analyses agree on the significance of managerial efficiency in distinguishing banks by ownership and existence or non-existence of technical partnership agreement while risk level made the difference between banks with Lagos head-office and the other banks.

9. Based on the re-classification results of the logit analysis and both the resubstitution and crossvalidation results of the discriminant analysis, we observed

that the discriminant models had in most cases higher classification ability as reflected by the false positive rates (FPR) associated with the various models. These models on the average, had over 85% correct classification ability. This implies the misclassification rates were averagely less than 15%. Sinkey (1975), a notable study which also attempted reclassification of sample banks using reclassification and resubstitution (Lachenbruch classification), recorded misclassification rates which averaged 25% (reclassification) and 32% (resubstitution). Hunter and Srinivasan's Probit model of newly chartered commercial banks in the U.S. exhibited correct classification percentages ranging between 72% and 88% over the 8-year period 1981 to 1988. Pantallone and Platt's (1987) logit model of U.S. commercial banks also exhibited between 73.5% and 83.1% correct classification rates. The model's predictive capability improved as the period of a bank's failure got closer. Our model's impressive predictive capability may have been accounted for by the relatively small sample size. Pantallone and Platt, and Sinkey had 339 and 220 sample commercial banks while Hunter and Srinivasan had 169 commercial banks.

These models also performed very well when subjected to logit analysis and classification. On the other hand the logit models performed less creditably when subjected to discriminant analysis as they exhibited lower FPRs. We are thus inclined to prefer the discriminant models to the logit models for their observed performance in the comparison conducted. The models obtained in respect of ownership, head-office location and technical partnership were less impressive in their reclassification ability.

10. Comparing the results for the pre-SAP and SAP periods, there is reason to believe that only managerial efficiency was significant in distinguishing banks by performance pre-SAP and while it continued during the SAP period, some other factors also began to be significant and these included the degree of risk, liquidity and capital adequacy. The univariate analysis tends to confirm that over the SAP period the level of risk reduced for resistant banks while liquidity improved along with their capital base position. Pantallone and Platt's study, covering an era of

deregulation, did not find managerial efficiency to be a significant determinant of commercial bank performance. They however found capital adequacy (i.e. capital-assets ratio) significant. Hunter and Srinivasan who did not include managerial efficiency in their probit analysis, also acknowledged the significance of the capital-asset ratio in an era of financial liberalisation and deregulation.

11. It is noteworthy that though the insignificance of capital adequacy over the greater part of the study period may be contrary to expectations of practitioners and bank supervisors, the development seemed consistent with the state of the banking industry at this time. This development, more specifically, could be a reflection of the grossly under-capitalized nature of all operating banks at the time. This issue had only begun to receive attention in the new banking dispensation. The fact that Nigerian banks have declared huge profits pre-SAP in spite of the state of the capital base of the banks may well explain this development.

12. Our appraisal of the National Bank situation revealed that managerial inefficiency is positively and significantly associated with bank vulnerability and dismal performance. The issue of ownership, board composition and management as they relate to managerial inefficiency and consequently dismal bank performance was brought to light. The conclusion is that wholly government owned banks tend to experience frequent changes in the composition of their board, which, invariably, were politically motivated. As a result the aims of the board members are usually at variance with the profitability objective of the bank, in addition to the fact that the education and professional background of many board members make them unqualified for appointment as directors of banks. The political aims of the board, and the small probability of remaining in key positions in the bank as well as the apparent divergence in the aims of board and management which are also observed by the general staff members inadvertently lead to staff indiscipline, lack of commitment, increase in fraudulent practices, the eventual result of which will be dismal performance or even the collapse of the bank. If such were to be allowed to

continue for sometime as in the case of National Bank, the bank will eventually become vulnerable to financial difficulty. This trend is common among government owned banks, only that the extent varies. This situation needs to be corrected with urgency. It is hoped that the National Bank case will serve as a good case in point and an example to banks in similar situation.

9.3 Some Policy Recommendations

We find it necessary to make a few key recommendations in the light of the findings and conclusions of this study.

Firstly, the monetary and supervisory authorities, in particular the Central Bank, should undertake, from time to time, an assessment of both its capacity and capability to effectively supervise and monitor the adherence of banks to banking regulations. This recommendation is a fall-out of the expectation of the majority of the respondent banks that CBN should help to protect banks and prevent them from failing. To do this effectively, granted that the argument is acceptable, requires that the CBN be capable. This is more critical in the light of the sudden expansion of the banking sector in recent times. With an increase in the number of banks of over 300 per cent in the SAP-period as well as an increase in the spate of regulations and guidelines being issued to banks, the need to monitor operating banks is not only imperative but also poses a special challenge to the monetary authorities. It also needs to convince the operating banks of its ability to effectively perform the *watchdog* role.

Secondly, further to the above suggestion, it will be necessary for the supervisory authorities or arms of the monetary authorities to adopt more scientific methods in their examination function. There are reports of such regulatory/supervisory institutions in the developed countries which not only contributed to the research on early warning and bank performance models but have also adopted them in carrying out their supervisory functions. In line with Pettway and Sinkey (1980) such models when applied can be used to set on-site examination priorities for the supervisory authorities. These approaches can help achieve

efficiency in the allocation of supervisory resources devoted to preserving and encouraging a sound and competitive banking system. A similar view is shared by Korobow and Stuhr (1975).

Managerial efficiency is one factor that has been established in this study as a significant factor for commercial bank performance in Nigeria over both the pre-SAP and SAP periods. It will therefore not be out of place to maintain that this factor is likely to remain a major determinant of bank performance in the near future. This is also in line with the key role that both the management as well as the board of directors have to play in ensuring sound bank performance. The chances of the positive effects that the overall bank management will have on bank performance will remain low for as long as the composition of the board and the management of banks is not overseen to some extent by the CBN. The CBN should put in place a process or framework that will ensure that the integrity and capability of banks' boards are unquestionable. It should also educate the banks on the relationship between the management and the board as well as their respective roles in the overall management of a bank. A situation in which there is almost always an *impasse* between the two groups of management that has to be settled in court threatens the industry a great deal.

We should mention also that the restrictions relating to the composition of banks' board be applied also to the wholly government owned banks. The dismal performance exhibited by this class of banks is largely traceable to the composition and frequency of changes of their boards. Being in most cases large banks, their collapse will have significant disruptive effects on the industry as well as the economy as a whole. It should then be suggested that perhaps it would be better if government divests itself considerably from the banking industry. This suggestion is further buttressed by the fact that almost all banks which are non-performing are either wholly or predominantly-owned by federal or state governments. In line with the general policy of economic deregulation, a reduction of the presence of government in banking operations is very desirable as it could bring about improved efficiency in the sector. This suggestion is without prejudice to the fact that government may have

developmental objectives. Such has the adverse effect of constraining bank performance at least in the short-run. Experience in Nigeria has, however, shown that the objectives of government involvement are not quite developmental, even if they had been intended *ab initio*. The rate at which federal and state governments had changed hands which has invariably led to similar frequent changes in the boards and management of these government owned banks as well as the factors which have motivated these changes seem to indicate that such developmental objectives would have become of secondary importance in preference for other non-developmental and perhaps other political and personal objectives. On the other hand, even if there were well articulated developmental objectives for government's presence in banking, the rate at which the board composition changes, thus bringing about instability, would most definitely impair the attainment of these objectives.

9.4 Limitations of Study and Suggestions for Further Research

Though a considerable amount of analysis has been conducted in this study, no claim can be made that it has been exhaustive or even absolutely conclusive in its results. One major limitation relates to the sample upon which the analysis has been based. Out of the thirty three (33) commercial banks which existed as at end-1985, our effective sample consisted twenty-two (22) commercial banks. Indeed, the population is rather small and could have introduced bias into our analysis or at least restricted the universality of conclusions of analysis based on them. In effect further research would need to be conducted with almost all existing Nigerian commercial banks consisting the sample. They are now about 125 in number, with about 65 being commercial. Such analysis could also further assess the conclusions of this study post deregulation. To make for a meaningful analyses, one needs to mention that there is urgent need to improve on the data situation in the sector as well as on the ease of accessibility. Comprehensive and consistent database needs to be maintained for all operating banks, in particular, to aid improved monitoring and supervision, which are becoming more important and vital with the significant growth and expansion of the Nigerian banking industry.

Further to this, to further reduce the limited applicability of our findings, as a result of the relatively small sample size, as noted earlier the data can be pooled over time to enhance the database and ultimately the efficiency of the results. The results of such analyses can then be compared with our period-based results for any possible semblance while observing the changes over the periods, which, in this case seem to have been pronounced.

About 125 banks now operate in the industry and this represents a much more acceptable size for the results of statistical analysis to improve in accuracy and import. It will be necessary to conduct further analyses based on these banks which obviously are not all performing or even resistant, inspite of the fact that the majority are new.

The extent of analysis and the focus of this thesis does not provide adequate room nor does it take on the responsibility of finding which of the identified models is best for classifying Nigerian commerical banks into vulnerable and resistant categories. In fact, the performance classification criteria make it fairly difficult to decide on an adequate model. The criteria are thus far subjective and a meaningful model which could be adopted by the monetary authorities can only be identified objectively if and when an agreement has been reached on which criteria is acceptable to the authorities above all others. In actual fact, further research could be conducted based on a different set of criteria than those which have been adopted in this study. We have employed the return on assets as the basis for classifying banks into different classes. Other studies could assume different or modified definitions, depending on the relevance for the chosen economy. Such studies as would identify a model which could be applied in practice are necessary, in particular, to help bank examiners and supervisors develop a queue of banks requiring examination as was suggested in Pettway and Sinkey (1980).

In this study, we have concentrated on both financial and other factors, with greater emphasis on financial ratios to the neglect of market factors such as stock prices. Pettway and Sinkey (1980), and more recently Simmons and Cross (1991), have shown that market information, in addition to financial ratios, are good

indicators of the health status of banks. Given the nature and state of the capital market in Nigeria, such a study will be of immense importance, even moreso when the Nigerian capital market is itself being deregulated.

Also, it has not been possible to consider the effect of bank competition on bank performance in this study. With the unfolding developments going on now in the banking industry such needs to be determined. Indeed, such a study can generate more conclusive results as to whether the influx of new banks and the consequent increase in competition would lead to bank failure or better still, affect the performance of banks.

Our study has also excluded merchant banks. However, this class of banks have grown in number, in size as well as in scope of activity, that they should also begin to attract our attention. With 54 of these banks out of a total of 125 banks, we would benefit a great deal from a study of their performance characteristics and how they differ from those observed for commercial banks, especially now that the latter are being allowed into certain activity areas (such as leasing and performance of issuing house functions), which hitherto were the exclusive preserve of merchant banks.

Given the fact that the Structural Adjustment Programme (SAP) is of medium to long-term nature, one can view the results and conclusions of this study as preliminary. Consequently a more confirmatory research would be required to be conducted as the significant effects of the SAP are being experienced as from the medium term. The trend in performance of banks during the SAP period would perhaps be much clearer then than it is now.

On the technical side, the study has shown that certain discriminant models may be more appropriate than corresponding logit models inspite of the fact that theory makes us believe that these techniques are interchangeable, being similar techniques for a particular problem. More research is needed along this line to further bring out the practical differences, advantages and disadvantages associated with these techniques to aid researchers in selecting the more appropriate technique for their use.

Also, a critique of the stepwise, forward, and backward selection procedures of both the MDA and logit analyses is that they do not take into account the relationship between variables that have not yet been selected, with the possible consequence that some important variables could be excluded in the process. This, being a general limitation, further qualifies our conclusions just as it has for other studies which have employed similar techniques.

REFERENCES

- Abegunde, E. A.** (1990) A Discriminant Analysis of Bank Lending: A Case Study of Union Bank, Unpublished M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.
- Adama, A. E.** (1991) "Commercial Banks' Branch Development And Network in Nigeria: A Performance Appraisal" Unpublished M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.
- Adekanye, F.A.** (1982) The Elements of Banking in Nigeria (F & A Publishers, Lagos).
- Adekanye, F.A.** (1986) "An Application of Linear Programming to Commercial Bank Portfolio Management in Nigeria", Unpublished M.Sc Research Project, University of Ibadan.
- Adewunmi, W.** (1984) Loan Management in Nigeria Bangor Occasional Papers in Economics, No. 21, University of Wales Press.
- Ajayi, C. A.** (1989) "Corporate Failures in a Recession", Nigerian Financial Review, Vol 2, No. 4.
- Ajayi, S.I. and O. Ojo** (1981) Money and Banking: Analysis and Policy in the Nigerian Context (Allen and Unwin, London).
- Alejo, D.J.O.** (1988) "A Multiobjective Asset Management Model for Nigerian Commercial Banks", M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.
- Altman, E.I.** (1968) "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", Journal of Finance, September, pp. 589-610.
- Altman, E.I.** (1973) "Predicting Railroad Bankruptcies in America", Bell Journal of Economics and Management Science, vol. 4, Spring.
- Altman, E. I. and Loris, B.** (1976) "A Financial Early Warning System For Over-The-Counter Broker-Dealers" The Journal of Finance, vol. XXXL, No. 4. September.
- Amemiya, T.** (1981) "Quantitative Response Models: A Survey", Journal of Economic Literature, vol. 19, December, pp. 1483-1536.
- Apilado, V. C. and T.G. Gies** (1972) "Capital Adequacy and Commercial Bank Failure", The Bankers Magazine, vol. 155, No. 3, Summer, pp. 24-30.

- Ariyo, A. (1985)** "Enhancing Judgemental Accuracy in Bank Lending Decisions: Some Issues and some Suggestions," The Nigerian Journal for Economic and Social Studies.
- Ariyo, A. (1986)** "Financial Ratios for Bankruptcy Prediction: A Consensus Approach", Vilkalpa, Vol. II, No. 1, Jan - March, 1986.
- Arshadi, N. and E.C. Lawrence, (1987)** "An Empirical Investigation of New Bank Performance", Journal of Banking and Finance, vol. 11, March, pp. 33-48.
- Banks and Other Financial Institutions Decree (BOFID) 25, June 1991**, (Federal Government Press, Lagos, Nigeria).
- Bank of England (1971)** "Competition and Credit Control", Bank of England Quarterly Bulletin, June.
- Bank of England (1974a)** "Speech of the Governor to the Institute of Bankers at Bristol", Bank of England Quarterly Bulletin, March, pp. 54-55.
- Bank of England (1974b)** "Banking Supervision", Bank of England Quarterly Bulletin, September, pp. 262.
- Bank of England (1975)** "The Capital and Liquidity Adequacy of Banks", Bank of England Quarterly Bulletin, September.
- Bank of England (1980a)** "The Measurement of Liquidity", Bank of England Quarterly Bulletin, September.
- Bank of England (1980b)** "The Measurement of Capital", Bank of England Quarterly Bulletin, September.
- Baltensperger, E. (1972a)** "Economies of Scale, Firm Size and Concentration in Banking", Journal of Money, Credit and Banking, vol. 4, August, pp. 467-488.
- Baltensperger, E. (1972b)** "Costs of Banking Activities - Interactions Between Risk and Operating Costs," Journal of Money, Credit and Banking, vol. 4, pp. 595-611.
- Baltensperger, E. (1974)** "The Precautionary Demand for Reserves," American Economic Review, vol. 64, March, pp. 205-210.
- Baltensperger, E. (1980)** "Alternative Approaches to the Theory of the Banking Firm", Journal of Monetary Economics, vol. 6, pp. 1-37.
- Barnett, R.E. (1972)** "Anatomy of a Bank Failure", Magazine of Bank Administration (USA), April.

Baumol, W.J. (1952) "The Transactions Demand for Cash: An Inventory Theoretic Approach", Quarterly Journal of Economics, vol. 66, pp. 545-556.

Beaver, W.H. (1966) "Financial Ratios as Predictors of Failure", Journal of Accounting, Supplement to vol. 4, pp. 71-127.

Beaver, W.H. (1968) "Alternative Accounting Measures as Predictors of Failure", Accounting Review, vol. 43, January.

Bell, F.W. and N.B. Murphy (1968) "Costs in Commercial Banking: A Quantitative Analysis of Bank Behaviour and its Relations to Bank of Boston", Report No. 41, Boston: Federal Reserve Bank of Boston.

Benston, J. (1972) "Economics of Scale in Financial Institutions", Journal of Money, Credit and Banking, vol. 4, No. 2, pp. 1-21.

Benston G.J. and C.W. Smith (1976) "A Transactions Cost Approach to the Theory of Financial Intermediation", Journal of Finance, vol. 3, No. 1, May, pp. 215-31.

Blair, R. and A. Heggestad (1978) "Bank Portfolio Regulation and the Probability of Bank Failure", Journal of Money, Credit and Banking.

Board of Governors of the Federal Reserve System, Annual Reports and Federal Reserve Bulletin, (several issues).

Brewer, V.L. and W.P. Dukes (1976) "Empirical Evidence on the Risk-Return Relationship between Banks and Related Bank Holding Companies", Review Business Economic Research, Spring, vol. 11, No. 3, pp. 56-65.

Broaddus, A. (1972) "Linear Programming: A New Approach to Bank Portfolio Management", Monthly Review, Federal Reserve Bank of Richmond, November. pp. 3-11.

Burns, A.F. (1974) "Maintaining the Soundness of our Banking System", Federal Reserve Bank of N.Y. Monthly Review, November, pp. 263-267.

Buser, S.A., A.H. Chen and E.J. Kane, (1981) "Federal Deposit Insurance, Regulatory Policy and Optimal Bank Capital", Journal of Finance, March, vol. 36, 1) pp. 51-60.

Butler, L.B. (1975) "An Approach to the Analysis of Bank Capital Adequacy", Paper presented at the Conference of Bank Structure and Competition, Federal Reserve Bank of Chicago, May.

Byerly, R.A. (1960) "The Use of Mathematical Models in the Analysis and Improvement of Bank Operations", NABAC Research Bulletin, vol. 1, No. 5, (May), pp. 12-19.

Carey, G. (1975) "Reassessing the Role of Bank Capital", Journal of Bank Research, Autumn, pp. 165-169.

Chambers, D. and A. Charnes, (1961) "Inter-Temporal Analysis and Optimization of Bank Portfolios", Management Science, vol. 7, No. 4, July, pp. 393-410.

Charnes, A. and S. Thore (1966) "Planning for Liquidity in Financial Institutions", Journal of Finance, vol. 21, No. 4, December, pp. 649-74.

Cheng, P.L. (1962) "Optimum Bond Portfolio Selection", Management Science, Vol. 8, No. 4, pp. 490-9.

Chesher, A.D., D.K. Sheppard and J.L. Whitewell (1974) "Some aspects of Prudential Controls and the Banking System", paper read to Money Study Group of Social Science Research Council, 6th December, (reprinted in The Banker, January).

Chesser, D. L. (1974) "Predicting Loan Non Compliance", Journal of Commercial Bank Lending, August.

Cohen, K.J. (1969) "A Realistic Approach to Implementing Management Science", The Magazine of Bank Administration, vol. 45, No. 9., September, pp. 28.

Cohen K.J. (1970) "Improving the Capital Adequacy Formula", Journal of Bank Research, vol. 1, No. 1, Spring, pp. 13-16.

Cohen K.J. (1972) "Dynamic Balance Sheet Management: A Management Science Approach", Journal of Bank Research, vol. 2, No. 4, Winter, pp. 9-19.

Cohen, K.J. and S. Thore (1970) "Programming Bank Portfolios Under Uncertainty", Journal of Bank Research, vol. 1, No. 1, Spring, pp. 42-46.

Cohen, K.J. and D.P. Rutenberg, (1971) "Toward a Comprehensive Framework for Bank Financial Planning", Journal of Bank Research, vol. 1, No. 4 (Winter) pp. 41-57.

Collins, P. J. (1990) "Finance in the '90s" Paper presented at the Twenty-Sixth Annual Conference on Bank Structure and Competition organised by Federal Reserve bank of Chicago, May 1990.

- Committee on the Workings of the Monetary System, (1959) "Radcliffe Report"** Cmnd. 827, H.M.S.O., London.
- Committee on Banking Regulations and Supervisory Practices (1988) International Convergence of Capital Measurement and Capital Standards**, July.
- Costanza, M.C. and Afifi, A.A. (1979) "Comparison of Stopping Rules in Forward and Stepwise Discriminant Analysis", Journal of the American Statistical Association, Vol. 74, pp. 777-785.**
- Cotter, R.V. (1966) "Capital Ratios and Capital Adequacy", National Banking Review, vol. 3, No. 3, March, pp. 333-346.**
- Cramer, E.H. (1951) "The Philosophy of Bank Capitalisation", Journal of Finance vol. 1, March, pp. 62-65.**
- Crockett, J.H. and M. Ungar (1981) "Capital Investment in Commercial Banking Reconsidered", Review of Business Economics, Winter, vol. 16, No. 2, pp. 76-88.**
- Crosse, H. (1973) Management Policies for Commercial Banks (2nd Edition, Prentice Hall, Inc., New Jersey).**
- Crosse, H. (1985) "Banking Structure and Competition", Journal of Finance, May, pp. 53.**
- Deakin, E. B. (1972) "A Discriminant Analysis of Prediction of Business Failure" Journal of Accounting, Spring.**
- Delong, F.G. (1966) "Liquidity Requirements and Employment of Funds", Chap. 2 in K.J. Cohen and F.S. Hammer (eds) Analytical Methods in Banking (Irwin, Homewood, Illinois, USA).**
- Diamond, D.W. and P.H. Dubvig (1986) "Banking Theory, Deposit Insurance and Bank Regulation", Journal of Business, Jan., vol. 59, no.1, pp. 55-68.**
- Dince, R.R. and J.C. Fortson (1972) "The Use of Discriminant Analysis to Predict the Capital Adequacy of Commercial Banks", Journal of Bank Research, vol. 3, No. 1, Spring.**
- Dothan, U. and J. Williams (1980) "Banks, Bankruptcy and Public Regulation" Journal of Banking and Finance, Vol. 4, March, pp. 65-87.**
- Dudley, L. (1970) "Credit Standards and Tight Money", Journal of Money, Credit and Banking, vol. 11, No. 4, November, pp. 420-434.**

Edgeworth, F.Y. (1888) "The Mathematical Theory of Banking," Journal of the Royal Statistical Society, vol. 51, March, pp. 113-127.

Fama, E.F. (1971) "Risk, Return and Equilibrium", Journal of Political Economy, vol. 79, Jan./Feb., pp. 30-35.

Fama, E.F. (1980) "Banking in the Theory of Finance," Journal of Monetary Economics, vol. 6, pp. 39-57.

Fama, E.F. (1985) "What's Different About Banks?", Journal of Monetary Economics, Vol. 15, pp. 29-39.

Fama, E.F. and M.C. Jensen (1983) "Agency Problems and Residual Claims", Journal of Law and Economics, vol. 26, pp. 327-349.

Federal Reserve Bank of N.Y. (1977) "A Nationwide Test of Early Warning Research in Banking," Federal Reserve Bank of N.Y. Quarterly Review, (Autumn) pp. 37-52.

Fraser, D.R. and L.M. Fraser (1990) Evaluating Commercial Bank Performance: A Guide to Financial Analysis (Bankers' Publishing Company, Rolling Meadows, Illinois).

Fried, J. (1970) "Bank Portfolio Selection", Journal of Financial and Quantitative Analysis, vol. 5, June, pp. 203-227.

Fraser, D. R., Phillips, W. and Rose, P. S. (1974) "A Canonical Analysis of Bank Performance", Journal of Financial and Quantitative Analysis, vol. 9, March, pp. 287-95.

Fraser, D.R. and P.S. Rose, (1972) "Bank Entry and Bank Performance", Journal of Finance, vol. 27, march, pp. 65-78.

Fredericks, J. R. (1990) "The Future Structure of the Banking Industry" Paper presented at the Twenty-Sixty Annual Conference on Bank Structure and Competition organised by Federal Reserve Bank of Chicago, May 1990.

Freeman, G.A. Jr. (1952) The Problem of Adequate Bank Capital (Illinois Bankers Association, Chicago).

French, G.E. (1991) "Early Corrective Action for Troubled Banks", FDIC Banking Review, vol. 4, no. 2, Fall, pp. 1-12

Friedman, B. and E. Formuzis (1975) "Bank Capital: The Deposit Protection Incentive," Journal of Economic Research, Autumn, pp. 209-218.

Frisch, R. (1965) Theory of Production, (Rand McNally & Company)

Frost, P.A. (1971) "Bank's Demand for Excess Reserves", Journal of Political Economy, vol. 79, July/Aug., pp. 802-82.

Gallagher, M. "Bank Capital: Definition, Adequacy and Issue Announcement Effects", Ph.D dissertation, Department of Banking and Finance, City University, London (forthcoming).

Gardener, E.P.M. (1978) "Capital Adequacy and Bank Prudential Regulation," Journal of Bank Research, Autumn, vol. 9, no. 3.

Gardener, E.P.M. (1981) "Testing Capital Adequacy by Computer Simulation", The Banker, May, p. 61.

Gardener, E.P.M. (1981) Capital Adequacy and Banking Supervision, Bangor Occasional Papers in Economics No. 19, University of Wales Press.

Gardener, E.P.M. (1982a) "Capital Adequacy and Banking Supervision - Towards a Practical System", Journal of Bank Research, Summer, 1982, vol. 13, No. 2, pp. 125-36.

Gardener, E.P.M. (1982b) "How much capital is Adequate", The Banker, November, pp. 41-47.

Gardener, E.P.M. (1991) "International Bank Regulation and Capital Adequacy: Perspectives, Developments and Issues" in Norton, J.J. ed. Banking Regulation and Supervision in the 1990s (Lloyd's of London Press Ltd.)

Gilbert, G.G. (1974) "Predicting De Novo Expansion in Bank Merger Cases", Journal of Finance, Vol. 29, March, pp. 151-162.

Gilbert, R. A. (1991) "Supervision of Undercapitalized Banks: Is there a Case for Change?" Review (The Federal Reserve Bank of St. Louis), vol. 73, No.3, May/June.

Giroux, G.A. (1980) "A Survey of Forecasting Techniques used by Commercial Banks", Journal of Bank Research, Spring, vol. 11, No. 1, pp. 8-19.

Gray, K.B. (1970) "Managing the Balance Sheet: A Mathematical Approach to Decision Making", The Journal of Bank Research, Vol. 1, Spring, pp. 34-44.

Greenbaum, S.I. (1967) "Competition and Efficiency in the Banking System - Empirical Research and its Policy Implications", Journal of Political Economy, vol. 75, No. 4, Part II, (August) pp. 461-497.

Guttentag, J.M. and R. Lindsay (1968) "The Uniqueness of Commercial Banks", Journal of Political Economy, vol 76, No. 5 (September/October), pp. 991-1014.

Hann, P.J. (1965a) "Factors Influencing Capital Adequacy in Commercial Banks", Unpublished Doctoral Dissertation, Western Reserve University.

Hann, P.J. (1965b) "The Conflict in Standards of Bank Capital", The Bankers Magazine, Vol. 148, No. 3, Summer.

Hayward, P.C. (1991) "Prospects for International Co-operation by Bank Supervisors" in Norton, J.J. ed Banking Regulation and Supervision in the 1990s

Heggestad, A. (1977) "Market Structure, Risk and Profitability in Commercial Banking", Journal of Finance, vol. XXXII, No. 4, pp. 1207-1216.

Hester, D.D. (1962) "An Empirical Examination of a Commercial Bank Loan Offer Function", Yale Economics Essay, vol. 2, No. 1, Spring, pp. 3-57.

Hester, D.D. and J.L. Pierce (1975) "Bank Management and Portfolio Behaviour", (New Haven).

Hirsch, F. (1977) "The Bagehot Problem", Manchester School of Economics and Social Studies, vol. XLV, No. 4, December, p. 241.

Hotelling, H. (1936) "Relations Between Two Sets of Variates", Biometrics, vol. 28, pp. 321-377.

Houget, E. R. (1975) "Techniques of Term Loan Analysis" Journal of Commercial Bank Lending, March.

Howard, D.S. and G.M. Hoffman (1980) Evolving Concepts of Bank Capital Management (Citicorp, New York).

Humpage, O. F. (1991) "Central Bank Intervention: Recent Literature, Continuing Controversy", Economic Review (Federal Reserve Bank of Cleveland), Vol 27, Nos.

Hunter, W. C. and Srinivasan, A. (1990) "Determinants of De Novo Bank Performance", Federal Reserve Bank of Atlanta, March/April.

Hyman, D. (1972) "A Behavioural Model for Financial Intermediation", Economic and Business Bulletin, Vol. 24, Spring - Summer.

Idowu, J. O. (1991) "Credit Appraisal And Monitoring In a Nigerian Commercial Bank: A Logit Regression Analysis", Unpublished M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.

Ihemedun, E. U. (1991) "Bank Capital Adequacy in Nigeria", Unpublished M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.

Isu, H.O. (1991) "Preventing Bank Failures in Nigeria, in the Coming Decades: Some Imperatives", Nigerian Financial Review, Vol. 4, No. 2.

Jacquette, F.L. (1967) "The Bank Liquidity - Profitability Tightrope", The Bankers Magazine, vol. 149, No. 3, Summer, pp. 94-100.

Johnson, F.P. and R.D. Johnson (1984) Commercial Bank Management (Dryden Press, New York).

Kahane, Y. (1977) "Capital Adequacy and Regulation of Financial Intermediaries", Journal of Banking and Finance, vol. 1, pp. 207-218.

Kareken, J. H. (1967) "Commercial Banks and the Supply of Money: A Market Determined Demand Deposit Rate", Federal Reserve Bulletin, vol. 53, October, pp. 1699-1712.

Kendall, M.G. (1961) A Course in Multivariate Analysis (Charles Griffin & Co., London).

Kendall, R.E. (1965) "High Cost of Deposits and Capital Adequacy", Unpublished thesis, Stonier Graduate School of Banking.

Klecka, W.R. (1980) Introduction to Discriminant Analysis, Unpublished Paper, University of Cincinnati.

Klein, M.A. (1971) "A Theory of the Banking Firm, Journal of Money, Credit and Banking, vol. 3, No. 2, Part I, pp. 205-218.

Klein, B. (1974) "Competitive Interest Payments on Bank Deposits and the Long-Run Demand for Money", American Economic Review, vol. 65, pp. 931-949.

Koehn, M. and A.M. Santomero (1980) "Regulation of Bank Capital and Portfolio Risk", Journal of Finance, vol. XXXV, No. 5, December, pp. 1235-44.

Koh, S.S. (1989) "The Korean Stock Market: Structure, Behaviour and Test of Market Efficiency", Ph.D Dissertation, Department of Banking and Finance, City University, London.

Komar, R.I. (1971) "Developing a Liquidity Management Model," Journal of Bank Research, Vol. II, No. 1 (Spring) pp. 12-19.

Korobow, L. and D.P. Stuhr (1975) "Toward Early Warning of Changes in Banks' Financial Condition: A Progress Report", Federal Reserve Bank of N.Y., Monthly Review, July.

Korobow, L. and D.P. Stuhr (1983) "The Relevance of Peer Groups in Early Warning Analysis", Federal Reserve Bank of Atlanta Economic Review, Vol. 68, November, pp. 27-34.

Korobow, L., D.P. Stuhr, and D. Martin, (1976) "A Probabilistic Approach to Early Warning of Changes in Bank Financial Condition", Federal Reserve Bank of New York, Monthly Review, Vol. 58, July, pp. 187-194.

Koskela, E. (1976) "A Study of Bank Behaviour and Credit Rationing" (Helsinki).

Kreps, C.H. and R.F. Wacht (1971) "A More Constructive Role for Deposit Insurance", Journal of Finance, vol. XXVI, May, pp. 605-614.

Lachenbruch, P. A. and Mickey M. R. (1968) "Estimation of Error Rates in Discriminant Analysis", Technometrics, vol. 10, No. 1, February, pp. 1-11.

Lambo, E. (1986) "Commercial Bank Portfolio Management," in Commercial Banking in Nigeria, edited by Oyejide and Soyode, Dept. of Economics, University of Ibadan.

Lawrence, R. J. et. al (1975) "The Performance of Bank Holding Company Acquisition", The Journal of Business.

Lawal, A. (1988) "Strategic Planning for Improved Performance in the Banking Industry: A case study of the First Bank of Nigeria Limited," Unpublished M.B.A. Project Report, University of Ibadan.

Leavitt, B.A. (1974) "Standard Needed for Judging Safe Level of Bank Capital," American Banker, April. p.4.

Lester, T. (1974) "The Secondary Scandal," Management Today, October.

Leyland, H.E. and D.H. Pyle (1977) "Information Asymmetries, Financial Structure, and Financial Intermediation", Journal of Finance, vol. 32, pp. 375-387.

Liebman, L.H. (1972) "A Markov Decision Model for Selecting Optimal Credit Control Policies", Management Science (June) 18 (10) pp. 519-525.

Lifson, K.A. and B.R. Blackmarr, (1973) "Simulation and Optimazation Models for Asset Development and Funds Sources Balancing Profit, Liquidity and Growth," Journal of Bank Research, (Autumn) pp. 239-255.

Lindow, W. (1963) "Bank Capital and Risk Assets," The National Banking Review, September. pp. 29-46.

Luckett, D.G. (1976) Money and Banking, (2nd edition, McGraw-Hill, Inc. New York).

Luckett, D.G. and S.B. Steib (1978) "Bank Soundness and Liability Management" Nebraska Journal of Economics and Business, Summer, pp. 27-42.

Mackara, W.F. (1975) "What Do Banks Produce?" Monthly Review, Federal Reserve Bank of Atlanta, vol. 60. 70-74.

Markowitz H.M. (1959) Portfolio Selection: Efficient Diversification of Investments (John Wiley, New York).

Martin, D. (1977) "Early Warning of Bank Failure: A Logit Regression Approach", Journal of Banking and Finance, vol. 1, November, pp. 249-277.

Marsel, S. (1981) Risk and Capital Adequacy in Commercial Banks (University of Chicago Press, U.S.A.).

Mayne, L.S. (1972) "Supervisory Influence on Bank Capital", Journal of Finance, Vol. 27 (June), pp. 637-651.

Mehr, R.I. and B.A. Hedges (1963) Risk Management in the Business Enterprise (Irwin, Homewood, Illinois USA).

Mehta, D. (1968) "The Formulation of Credit Policy Models", Management Science, October, vol. 15, No. 2, pp. 30-50.

Melnick, A. (1970) "Short-Run Determinants of Commercial Bank Investment Portfolios: An Empirical Analysis", Journal of Finance, vol. XXV, No. 111, June, pp. 639-649.

Melitz, J. and M. Pardue (1973) "The Demand and Supply of Commercial Bank Loans", Journal of Money, Credit and Banking, vol. 2, May, pp. 669-692.

Meyers, J.H. and E.W. Forgy (1963) "The Development of Numerical Credit Evaluation Systems", Journal of American Statistical Association, September, vol. 58, No. 303, pp. 799-806.

Meyer, P.A. and H.W. Pifer (1970) "Prediction of Bank Failures", Journal of Finance, September, pp. 853-868.

Miller, M.H. and D. Orr "A Model of the Demand for Money by Firms", Quarterly Journal of Economics, vol. 23, pp. 413-435.

Mingo, J.J. (1975) "Regulatory, Influence on Bank Capital Investment", The Journal of Finance, vol. XXX, No. 4, September, pp. 1111-1121.

Mingo, J. and B. Wolkowitz (1974) "The Effects of Regulation on Bank Portfolios, Capital and Profitability", Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago.

Modigliani, F. and M.H. Miller, (1958) "The Lost of Capital Corporation Finance and the Theory of Investment", American Economic Review, Vol. 47, June.

Morgan Bank (1986) Bank Analysis, mimeo, october.

Moore, B. (1968) An Introduction to Theory of Finance (The Free Press, N.Y.)

Morrison, G.R. (1966) Liquidity Preference of Commercial Banks (University of Chicago Press, Chicago).

Morrison, G.R. (1966) Liquidity Preference of Commercial Banks (University of Chicago Press, Chicago).

NABAC (National Association for Bank Audit, Control and Operations Research Institute) (1963) A Study for Improving Commercial Teller Operations, NABAC, Park Ridge, Illinois.

Niehans, J. (1978) The Theory of Money (Baltimore, U.S.A).

Norton, J.J. (1991) Bank Regulation and Supervision in the 1990s (Llyod's of London Press).

Norton, J.J. (1989) "Capital Adequacy Standards: A Legitimate Regulatory Concern for Prudential Supervision of Banking Activities", Ohio State Law Journal, Special symposium, winter.

Nwankwo, G.O. (1972) "Indigenisation of Nigerian Banking", Bankers Magazine, U.K. July, pp. 15-21.

Nwankwo, G.O. (1976) A Memorandum to the Financial System Review Committee, Lagos, 18th May, Para. 24.

Nwankwo, G.O. (1980) The Nigerian Financial System (The Macmillan Press, London).

Nyong, M.O. (1987) "Size Distribution of Nigerian Commercial Banks: A Markovian Stochastic Analysis", Paper presented at Faculty of Social and Management Science, Ogun State University, Ago Iwoye, February.

Nyong, M.O. (1987) "Size Distribution of Nigerian Commercial Banks: A Markovian Stochastic Analysis", Paper Presented at Faculty of Social Management Science, Ogun State University, Ago Iwoye, February.

O'Brien, R. and Datta T. (1989) International Economics And Financial Markets, The AMEX Bank Review Prize Essays (Oxford University Press, London).

Oduyemi, O.S. (1981) "Capital Adequacy Standards and Solvency of Banks," Unpublished M.Sc. Research project, Heriot-Watt University, Edinburgh, Scotland.

Okigbo, P.N.C. (1981) Nigerian Financial System (Longman Group, U.K.).

Onimode, B. (1986) "Commercial Banking Policy for Structural Transformation" in Commercial Banking in Nigeria, edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Orr, D. and W.G. Mellon (1961) "Stochastic Reserve Loans and Expansion of Bank Credit", American Economic Review, vol. 51, September, pp. 614-623.

Orji, H. O. (1989) "Developing and Maintaining an Effective Lending and Credit Administration Policy: The Case of Nigerian Banks", Nigerian Financial Review, Vol. 2, No. 3.

Orgler, Y.E. (1966) Evaluation of Consumer Loan Portfolios with Credit Scoring Models, Federal Deposit Insurance Corporation, Washington D.C.

Orgler, Y.E. (1969) "Selection of Bank Loans for Evaluation: An Analytical Approach" Journal of Finance, vol. 24, No. 1, March, pp. 75-80.

Orgler, Y.E. (1970) "A Credit Scoring Model for Commercial Loans", The Journal of Money, Credit and Banking, vol. 2, No. 4, November, pp. 435-445.

Orgler, Y.E. (1975) "Capital Adequacy and Recoveries from Failed Banks", Journal of Finance, December, Vol. XXX, No. 5, pp. 1366-1375.

Orgler, Y.E. (1975) "Capital Adequacy of Commercial Banks: A Question of Balance", Compendium of Major Issues in Bank Regulation (Washington, U.S. Government Printing Office), pp. 512-521.

Orgler, Y.E. and R.A. Taggat Jr. (1983) "Implications of Corporate Capital Structure Theory for Banking Institutions: A note", Journal of Money, Credit and Banking, May, vol. 15, No. 2, pp. 212-221.

Oyejide, T. A. (1986) "Deposit Relationship and Commercial Bank Earnings" in Commercial Banking in Nigeria edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Oyejide, T. A. (1990) "Major Developments and Innovations in the Nigerian Finance Environment since 1960" in Agbelusi, Yemi (ed) Innovations, Technology and the Nigerian Finance Sector, F.I.T.C. Lagos.

Oyejide, T. A. and A. Soyibo (1987) "Price Distortions in the Nigerian Banking and Finance Sector", Paper Presented at the Bankers' week of the 1991 Graduating Students of Banking and Finance

Oyejide, A. and A. Soyode (1986a) "Market Share and Profitability in Commercial Banking" in Commercial Banking in Nigeria, edited by Oyejide and Soyode, Department of Economics, University of Ibadan.

Oyejide, A. and A. Soyode (1986b) "Commercial Banking and Economic Development" in Commercial Banking in Nigeria edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Oyejide, A. and A. Soyode (1986c) "Commercial Banking Structure and Performance: Empirical Evidence of Some Theoretical Links", in Commercial Banking in Nigeria edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Oyejide, A. and A. Soyode (1986d) "Issues in the Evolution and Regulation of Commercial Banks in Nigeria", in Commercial Banking in Nigeria, edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Oyejide, A. and A. Soyode (1986e) "Branch Network and Economic Performance - A Case Study of Nigeria's Commercial Banks", in Commercial Banking in Nigeria edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Pantalone, C. C. and Platt, M.B. (1987) "Predicting Commercial Bank Failure Since Deregulation", New England Economic Review, July/August.

Parosh, J. and Tamari, M. "Financial Ratios as a Means of Regression Analysis", Bank of Israel, Economic Review, Vol. 47.

Paton, G.D. (1964) Report on Banks and Banking in Nigeria, Sessional Paper No. 7, Government Printer, Lagos.

Peltzman, S. (1970) "Capital Investment in Commercial Banking and its Relationship to Portfolio Regulation", Journal of Political Economy, vol. 78, No. 1, Jan/Feb., pp.1-26.

Pettway, R.H. (1976) "Market Tests of Capital Adequacy of Large Commercial Banks", Journal of Finance, vol. XXXI, No. 3, June, pp. 865-875.

Pettway, R.H. (1975) "Capital Adequacy of Commercial Banks: A Question of Balance", Compendium of Major Issues in Bank Regulation, (Washington U.S. Government Printing Office) May, pp. 512-521.

Pettway, R. H. and Sinkey, J. F. (Jr) (1980) "Establishing On-Site Bank Examination Priorities: An Early-Warning System Using Accounting and Market Information", Journal of Finance, vol. 35, No. 1, March.

Pesek, B. (1970) "Bank's Supply Function and the Equilibrium Quantity of Money", Canadian Journal of Economics, August, pp. 357-385.

Poole, W. (1968) "Commercial Bank Reserve Management in a Stochastic Model: Implications for Monetary Policy", Journal of Finance, vol. 23, pp. 769-791.

Porter, R.C. (1961) "A Model of Bank Portfolio Selection," Yale Economic Essays, vol. 1, Fall, pp. 323-359.

Pringle, J. (1971) "The Role of Capital in the Financial Management of Commercial Banks", Unpublished Ph.d Dissertation, Stanford University, U.S.A.

Pringle, J. (1971) "The Role of Capital in the Financial Management of Commercial Banks", Unpublished Ph.D Dissertation, Stanford University, U.S.A.

Pringle, J. (1974) "The Capital Decision in Commercial Banks", Journal of Finance, vol. 29, pp. 779-795.

Pringle, J. (1974) "The Capital Decision in Commercial Banks", Journal of Finance, vol. 29, pp. 779-795.

Pringle, J. (1975) "Capital and Performance of Banks as Financial Intermediaries", Journal of Money, Credit and Banking, November.

Pyle, D.H. (1971) "On the Theory of Financial Intermediation," Journal of Finance, vol. 26, June, pp. 737-747.

Pyndick, R.S. and D.L. Rubinfield, (1981) Econometric Models and Economic Forecasts, (New York, McGraw-Hill).

Ralti, R.A. (1979) "Stochastic Reserve Losses and Bank Credit Expansion," Journal of Monetary Economics, vol. 5, April, pp. 283-94.

Reed, E.W. (1964) "Appraising the Capital Needs of Commercial Banks", The Bankers Magazine, vol. 147, No. 3, Summer.

Reed, E.W., R.Y. Cotter, E.K. Gill and R.K. Smith, (1984) Commercial Banking (3rd edition, Prentice-Hall, Inc. Englewood Cliffs, N.J.)

Res, Z. (1991) "International Banking Risks, Capital Adequacy and Bank Performance", Paper Delivered at the Annual October Lecture of The Chartered Institute of Bankers of Nigeria, 3rd October.

Revell, J. (1974) "The Solvency of Banks," Paper read to Money Study Group of Social Science Research Council, 6 Dec. 1974 (reprinted in The Banker, January 1974).

Revell, J. (1975) Solvency and Regulation of Banks, Bangor Occasional Papers in Economics, University of Wales Press.

Ritzman, F. (1973) Die Schweizer Banken: Geschuchte - theorie-Statistik (Bern).

Robinson, R.I. (1962) The Management of Bank Funds, McGraw-Hill, N.Y.

Robinson, R.I. and R.H. Pettway (1967) Policies for Optimum Bank Capital (Association of Reserve City Bankers, Chicago).

Rose, P.S. and W.L. Scott (1978) "Risk in Commercial Banking: Evidence from Post War Failures", Southern Economic Journal, July, vol. 45, No.1, pp. 90-106.

Rose, P.S. and J.W. Kolaris (1985) "Early Warning System as Monitoring Device for Bank Condition", Quarterly Journal of Business and Economics, vol. 24, Winter, pp. 43-66.

Santomero, A.M. (1984) "Modelling the Banking Firm: A Survey" Journal of Money, Credit and Banking, vol. 16, No. 4, pp. 576-605.

Santomero, A. and R. Watson (1977) "Determining the Optimal Capital Standards for the Banking Industry", Journal of Finance, September.

SAS/STAT (1990) User's Guide. (SAS Institute Incorporation North Carolina) Vol. 1 & 2.

Sealey, C.W. (1977) "Commercial Bank Portfolio Management with Multiple Objectives", Journal of Commercial Bank Lending, vol. 59, pp. 39-48.

Sealey, C.W. and J.T. Lindley (1977) "Inputs, Outputs and a Theory of Production and Cost of Depository Financial Institutions", Journal of Finance, vol. 32, September, pp. 1251-66.

Secrist, H. (1966) "National Bank Failures and Non-Bank Failures", Bloomington, Indiana, The Principia Press 1938, as quoted in Cotter, R. "Capital Ratios and Capital Adequacy", National Bank Review, vol. 3, No. 3, March, p. 344.

Short, B.K. (1977) "A Multivariate Statistical Analysis of Characteristics of Problem Banks", Journal of Finance, March, 1975.

Short, B.K. (1978) "Capital Requirement for Commercial Banks: A Survey of the Issues", International Monetary Fund Staff Papers, vol. 25, No.3, September, pp. 538-563.

Short, E.D., O'Driscoll, G.P. (Jr.) and F.D. Berger (1985) "Recent Bank Failures: Determinants and Consequences", Federal Reserve Bank of Chicago Proceedings of Conference on Bank Structure and Competition.

Simons, K. and S. Cross (1991) "Do Capital Markets Predict Problems in Large Commercial Banks?", New England Economic Review, May/June.

Sinkey, J.F. Jnr. (1975a) "A Multivariate Statistical Analysis of the Characteristics of Problem Banks", Journal of Finance, vol. 30, No. 1, March, pp. 21-36.

Sinkey, J.F. Jnr. (1975b) "Early-Warning System: Some Preliminary Predictions of Problem Commercial Banks" Paper presented at the Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago. (May).

Sinkey, J.F. and D.A. Walker (1975) "Problem Banks: Identification and Characteristics", Journal of Bank Research (Bank Administration Institute), Winter.

Smith, P.F. (1964) "Measuring Risk in Investment Credit", Management Science, November, vol. 11, No. 2, pp. 327-340.

Sobodu, O.O. and Amayigha, J.C. (1991) "An Assessment of Current Deposit Mobilization Oriented Products of Nigerian Banks", Nigerian Financial Review, Vol.4., No.1.

Sobodu, O. O. and Sotonwa, A. O. (1991) "Impact of the Prudential Guidelines on the Assets of Selected Nigerian Banks", Unpublished Paper, Department of Economics, University of Ibadan.

Sobodu, O. O., Ogunkola, O. and Etukudo, M.S. (1991) "On the Structure and Management of Merchant Banks' Deposit Liabilities In Nigeria", Nigerian Financial Review, vol. 3, No. 4.

Sotonwa, A. O. (1991) "Banking Regulation, Innovation And Strategic Management of Change in the Nigerian Banking Industry", Unpublished M.Sc. Project Report, Department of Economics, University of Ibadan, Ibadan.

Soyibo, A. (1991) "The Nigerian Banking System in the Context of Policies of Financial Regulation and Deregulation", Unpublished Paper, Department of Economics, University of Ibadan.

Soyibo, A. and Adekanye, F. (1991) "The Real Interest Rate in Nigeria: It's Measurement and Implications for Monetary Policy", Nigerian Financial Review, vol. 3, No. 4.

Soyibo, A. and L.O. Aina (1984) "Inventory Theoretical Analysis of Cash Management in a Commercial Bank", Unpublished paper, Department of Economics, University of Ibadan.

Soyibo A. and K. Aiyedogbon, (1985) "A Markovian Approach to Credit Management" in Eno L. Inanga (Ed.) Managing Nigeria's Economic System (Centre for Management Development, Lagos) pp. 131-142.

Spong, K. (1990) Banking Regulation: Its Purposes, Implementation and Effects (Federal Reserve Bank of Kansas City, USA.

Sprague, O.M.W. (1927) "The Causes of Bank Failures and Some Suggested Remedies", American Bankers Association Journal, November, pp. 304-308.

Staats, W.F. (1965) "Capital Adequacy of Commercial Banks," Unpublished Ph.D Dissertation, University of Texas, U.S.A.

Stuhr, D.P. and R. Van Wicklen (1974) "Rating the Financial Condition of Banks: A Statistical Approach to Aid Bank Supervision", Federal Reserve Bank of N.Y. Monthly Review, September, pp. 233-235.

Taggart R.A. Jr. and S.I. Greenbaum, (1978) "Bank Capital and Public Regulation", Journal of Money, Credit and Banking, vol. 10, No.2, May, pp. 139-157.

Tamari, M. (1965) Financial Ratios as a Means of Forecasting Bankruptcy", International Management Review.

Tamari, M. (1978) "Financial Ratios: Analysis and Prediction" (Paul Elek, London).

Tatsuoka, M. (1974) Multivariate Discriminant Analysis (North-Holland, Amsterdam).

Teriba, O. (1986a) "Nigeria's Indigenous Banks", in Commercial Banking in Nigeria, edited by Oyejide and Soyode, Department of Economics, University of Ibadan.

Teriba, O. (1986b) "The 1967-69 Banking Amendments in Nigeria - An Appraisal", in Commercial Banking in Nigeria, edited by Oyejide and Soyode, Department of Economics, University of Ibadan.

Teriba, O. (1986c) "Competition for Bank Deposits in Nigeria", in Commercial Banking in Nigeria, edited by Oyejide & Soyode, Department of Economics, University of Ibadan.

Tower, R. (1974) "Monetary Creation and the Theory of the Banking Firm", Journal of Finance, Vol. XXIX, March pp. 57-72.

Uche, R. (1991) "Boardroom Politics" Business Perspectives, Vol. 1, No. 1.

Uzoaga, W. O. (1986) "Legislating Bank Capital in Nigeria" in Oyejide, T. A. and A. Soyode (ed), Commercial banking in Nigeria, University Publishing Consultant, Ibadan.

Van Horne, J. C. (1983) Financial Management and Policy, (Prentice-Hall International Inc., London).

Vojta, G.J. (1973) Bank Capital Adequacy (City Corp., New York).

Vojta, G.J. (1974) "A Dynamic View of Capital Adequacy", Journal of Commercial Bank Lending, December.

Watson, J. (1975) "A Regulatory View of Capital Adequacy", Journal of Bank Research, Autumn, pp. 170-72.

Wesson, B. (1985) Bank Capital and Risk: A Survey of the London Clearing Bank Groups (1976-1983) (The Institute of Bankers, London).

Wood, J. (1970) "Two Notes on the Uniqueness of Commercial Banks", Journal of Finance, pp. 99-109.

Wood, J. (1983) "Familiar Developments in Bank Loans Markets", Federal Reserve Bank of Dallas, Economic Review, pp. 1-15.

Wriston, W.B. (1973) Introduction to Bank Capital Adequacy in Vojta, G.J. (ed), Bank Capital Adequacy (Citicorp, New York).

Yeats, A. J., Irons, E. D. and Rhodes, S. A. (1975) "An Analysis of New Bank Growth", The Journal of Business.

Dear

I seek your assistance for the completion of the attached questionnaire which I am using to collect some of the data I need for my research leading to the award of the Ph.D degree of the City University, London, United Kingdom. The study is entitled "Commercial Bank Performance in a Developing Country: A Case Study of Nigeria".

As you would observe, the information required is pertinent to the title. The major area of emphasis of the study is the identification and/or isolation of critical performance indicators which can serve as track signals for identifying 'problem' banks early enough in order to avoid bank failures.

The perceptions and views of top bankers like you will help enrich this study. It is in the light of this that I request your assistance in the completion of the questionnaire. Be assured that any information supplied will as much as possible, be treated with the strictest confidentiality.

I thank you for your cooperation and hope that the study will be of use to the industry.

With warmest regards.

Sincerely yours,

FEMI A. Z. ADEKANYE

[illegible]

8. What kind of partnership arrangement existed between your Bank and the technical partners. (Please indicate by encircling the right choice)

1. Management Structure/Assistance

2. Staff/Personnel/Composition

9. Kindly list your technical partners indicating their country of origin.

	<u>Name of Partner (s)</u>	<u>Country</u>
(i)		
(ii)		
(iii)		
(iv)		

10. Kindly indicate in each year whether management of your bank was predominantly foreign or domestically controlled.

Use F: If predominantly foreign

D: If predominantly domestic

	80	81	82	83	84	85	86	87	88	89
Management Type										

B. BRANCH NETWORK AND EMPLOYMENT

11. Does your bank have any other branches apart from the head-office branch?

1. Yes

2. No.

12. If yes, kindly give the total number of branches opened over the years by locational composition.

4.

[illegible]

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
5. Total Capital										
6. Share-holders' Funds										
7. Bad Debt Provision										
8. Total Reserves										
9. Total Operating Income										
Loan Income										
Securities Income										
Other Income										
10. Government Securities Holding										
11. Other Borrowed Funds										
12. Cash Holding										
13. Short-term Assets										
14. Net Income										
15. Dividend		1							1	

16. *In your opinion, which of the following factors are the major determinants of Bank Performance. (Encircle your choice).*

- | | |
|---|---|
| 1. Capital Adequacy | 7. Revenue Application |
| 2. Asset Quality | 8. Ownership |
| 3. Managerial Performance
(efficiency) | 9. Regulation/Deregulation |
| 4. Loan Portfolio | 10. Number and Distribution of branches |
| 5. Liquidity | 11. Violation of Regulatory guidelines |
| 6. Revenue Sources | 12. National economic variables. |

17. *Kindly rank the factors in Q. 16 in order of importance of these factors to bank performance.*

- | | |
|------|-------|
| i. | vii. |
| ii. | viii. |
| iii. | ix. |
| iv. | x. |
| v. | xi. |
| vi. | xii. |

18. *Which of these factors do you believe are positively associated (correlated) with bank failure?*

- | | |
|------|-------|
| i. | v. |
| ii. | vi. |
| iii. | vii. |
| iv. | viii. |

19. *Which of these factors do you believe to be negatively (associated) correlated with bank failure?*

- | | |
|------|-------|
| i. | v. |
| ii. | vi. |
| iii. | vii. |
| iv. | viii. |

Kindly complete the following in relation to the actual performance of your bank and stipulated CBN Credit Guidelines for the period indicated

Use: C for CBN Guideline

A for Actual Performance

[illegible]

21. Which of the above factors (Q.16) would you adjudge the most important in signalling possible bank failure?

- | | |
|----|----|
| 1. | 4. |
| 2. | 5. |
| 3. | 6. |

22. Briefly give reasons for your choice in Q. 21

23. In your own opinion under what conditions/circumstances would you judge a bank as running the risk of failing?

24. What methods would you adopt as a banker to forestall possible bank failure?

25. Would you share the opinion that the CBN should help protect and prevent bank failure?

- | | |
|--------|--------|
| 1. Yes | 2. No. |
|--------|--------|

26. Kindly state your reason(s) for your answer to Q.25

27. Kindly indicate whether the persistent violation of the following CBN monetary policy guidelines would eventually lead to bank failure?

- | | | |
|----|-----------------------------------|----------|
| 1. | Cash Ratio | Yes / No |
| 2. | Liquidity Ratio | Yes / No |
| 3. | Capital Adequacy | Yes / No |
| 4. | Sectoral Credit Allocation Ratios | Yes / No |

28. Please, list some of CBN's guidelines that you believe are beneficial to commercial bank performance.

- (i) _____
- (ii) _____
- (iii) _____

29. Please, list some of CBN's guidelines that you believe are detrimental to commercial bank performance.

- (i) _____
- (ii) _____
- (iii) _____

30. Do you support the view that the recent influx of new banks into the industry may result in bank failures?

- (1) Yes (2) No

31. Briefly, give some of your reasons for your answer in Q.30.

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1985

	Bank Code	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1.	Total Loans	55.83	.	262.29	379.54	71.45	757.09	520.09	1492.98	184.93	512.47
	Agric Loans	7.87	.	30.35	.	.	.	.	170.2	16.46	71.9
	Manufacturing Loans	13.48	.	95	.	.	.	.	203.05	78.19	179.02
	Other loans	34.48	.	136.92	.	.	.	.	1119.74	90.28	261.55
2.	Total Operating Expenses	8.42	.	38.73	81.98	4.65	101.71	30.18	334.58	11.88	66.3
	Interest on Loans	3.2	.	0.05	56.82	6.29	2.46	.	124.76	12.77	43.52
	Wages & Salaries	2.07	.	5.6	8.25	1.12	30.42	.	100.66	4.84	.
	Other Expenses	6.35	.	33.08	16.91	.	28.45	.	109.16	7.05	.
3.	Total Assets	153.95	.	419.11	1586.06	197.55	1265.69	897.74	4370.05	370.22	1803.5
	Risk Assets*	108.32	.	287.78	1363.87	131.76	996.07	649.32	3997.07	259.77	856.69
	Current Assets	145.87	.	131.33	222.19	65.79	406.08	450	4301.52	215.02	946.83
4.	Total Deposit	113.67	.	354.3	1285.02	155.38	951.41	816.5	3380.45	350.85	823.02
	Time Deposit	20.17	.	75.24	479.27	51.57	163.59	316.21	490.29	125.79	435.14
	Current Deposit	74.78	.	96.17	787.29	21.43	363.86	185.16	1324.6	85.89	273.29
	Savings Deposit	18.58	.	173.56	18.5	0.33	413.04	64.33	818.59	25.49	111.2
	Other Deposit	0.16	.	9.38	0	82.05	10.91	250.81	746.97	113.76	3.4
5.	Total Capital	7.5	.	10.96	20	10	12	17.53	54.43	10	27
6.	Share-holders' Funds	7.64	.	25.11	72.64	9.95	12.5	39.39	206.88	19.37	111.69
7.	Bad Debt Provision	0.08	.	2.2	5.53	0	114.75	81.06	183.21	4.11	59.67
8.	Total Reserves	0.14	.	14.15	24.84	0	0.5	21.86	143.14	9.37	41.7
9.	Total Operating Income	11.07	.	40.72	135.27	12.13	101.54	111.72	415.74	37.32	146.39
	Loan Income	4.65	.	32.86	61.44	5	70.91	70.09	195.67	17.15	43.52
	Securities Income	3.69	.	3.62	56.27	.	3.64	31.88	162.61	5.82	50.8
	Other Income	2.74	.	4.24	17.56	.	26.99	9.79	57.48	14.35	52.07
10.	Government Securities										
	Holding	7.76	.	46.13	465.41	54.01	20.5	45.36	1908.12	81.37	730.78
11.	Other Borrowed Funds	0	.	0	0	0	50.32	0	0	0	0
12.	Cash Holding	4.55	.	14.5	12.35	1.29	35.06	10.48	41.79	6.53	20.23
13.	Short-term Assets	13.53	.	131.33	33.13	53.22	218.81	453.58	331.18	187.72	934.58
14.	Net Income	2.65	.	21.46	20.18	5.61	-0.17	4.92	290.97	4.26	40.84
15.	Dividend	0	.	0.7	5.18	1	0	0	8.17	1	9.12

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1985.

	Bank Code	NBN	PAB	NNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1.	Total Loans	505.47	244.57	236.71	33.86	472.71	1573.49	163.44	2.58	.	100.6
	Agric Loans	.	.	36.69	3.39	41.13	170.82	.	0.77	.	.
	Manufacturing Loans	.	.	89.72	8.87	.	524.24	.	1.36	.	.
	Other loans	.	.	110.31	21.6	.	878.42	.	0.45	.	17.19
2.	Total Operating Expenses	79.21	32.44	31.05	14.78	71.09	274.25	27.38	1.21	.	7.55
	Interest on Loans	1.83	.	13.53	9.76	48.41	162.17	.	0.25	.	6.04
	Wages & Salaries	28.53	.	17.52	4.32	11.46	73.16	.	0.32	.	3.6
	Other Expenses	48.85	.	.	0.7	11.22	38.91	.	0.65	.	197.07
3.	Total Assets	902.38	281.49	368.74	217.2	1042.11	4802.88	670	13.72	.	123.82
	Risk Assets*	745.36	263.09	227.11	71.57	577.09	4247.56	540	2.58	.	73.25
	Current Assets	47.8	266.36	359.31	103.88	1031.75	555.32	120	13.72	.	160.66
4.	Total Deposit	692.44	206.93	319.63	155.49	763.02	4319.6	333.57	11.5	.	45.15
	Time Deposit	215.81	70.08	99.79	137.82	511.29	1742.11	190.81	4.58	.	62.42
	Current Deposit	277.51	85.93	140.55	78.67	210.43	1094.17	106.84	6.58	.	52.5
	Savings Deposit	199.12	50.92	75.02	11.87	27.8	382.3	35.92	0.34	.	0
	Other Deposit	0	0	4.27	0	84.35	1101.01	0	0	.	5
5.	Total Capital	21.667	10	11.75	3	17.53	75	10	2.95	.	7.67
6.	Share-holders' Funds	21.67	18.66	14.46	5.85	39.39	209.09	20.58	2.46	.	.
7.	Bad Debt Provision	70.76	64.24	1.25	0.03	81.06	198.72	0	0.07	.	2.87
8.	Total Reserves	11.66	0.56	2.71	0.85	21.86	134.09	10.38	0	.	18.86
9.	Total Operating Income	83.42	11.25	33.48	16.3	111.77	376.27	63.71	0.85	.	10.64
	Loan Income	56.24	7.98	30.68	15.84	70.09	162.98	53.57	0.21	.	.
	Securities Income	9.73	.	.	.	31.88	176.93	.	.	.	.
	Other Income	17.08	3.27	2.79	0.38	9.79	36.36	10.14	0.65	.	.
10.	Government Securities										
	Holding	19.45	0	64.18	109.84	0	2464.19	32.65	2	.	.
11.	Other Borrowed Funds	0	0	0	0	0	0	112.89	0	.	7
12.	Cash Holding	21.62	11.56	16.2	2.3	10.48	32.21	0	0.27	.	0
13.	Short-term Assets	135.4	266.36	22.37	161.07	453.58	523.11	38.03	11.88	.	0
14.	Net Income	1.17	21.19	2.43	0.73	4.92	63.72	1.5	0.35	.	73.25
15.	Dividend	0	0	0	0	0	9.7	0	0	.	-1.67

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1986

	Bank Code	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1.	Total Loans	86.9	98.93	281.35	413.04	111.23	873.39	659.92	1845.96	248.59	730.63
	Agric Loans	12.96	7.69	48.14	.	.	.	.	267.53	19.92	131.97
	Manufacturing Loans	21.86	44.43	129.45	.	.	.	.	401.29	116.72	216.94
	Other loans	52.09	46.81	103.76	.	.	.	.	1177.13	111.95	381.72
2.	Total Operating Expenses	13.51	17.63	41.49	81.98	12.06	117.41	36.06	372.98	18.78	75.52
	Interest on Loans	.	4.11	0.04	56.82	9.89	2.53	.	134.59	17.51	62.68
	Wages & Salaries	2.8	0.2	5.74	8.25	2.02	32.68	.	113.06	6.96	.
	Other Expenses	10.71	0.69	35.71	16.91	.	82.21	.	125.34	11.82	.
3.	Total Assets	220.59	174.01	446.05	1586.05	648.54	1427.12	1432.14	5298.55	457.01	2109.8
	Risk Assets*	191.69	167.5	315.96	1363.87	217.37	1181.43	1008.72	3615.54	398.24	1349.1
	Current Assets	211.73	70.86	130.09	222.19	431.19	403.3	412.03	5219.69	208.55	760.64
4.	Total Deposit	158.22	156.69	375.99	1285.02	389.37	1027.89	1331.91	4000.25	409.05	787.61
	Time Deposit	54.98	34.39	103.75	479.23	106.64	229.36	371.52	820.46	133.34	324.61
	Current Deposit	67.56	17.09	108	787.29	52.41	329.82	218.89	1135.08	104.83	326.53
	Savings Deposit	35.48	2.39	162.82	18.5	0.89	428.39	76.63	1034.56	35.16	136.48
	Other Deposit	0	102.82	1.43	0	229.43	40.31	664.15	101015	135.72	0
5.	Total Capital	7.5	2	10.96	30	10	12	28.92	54.43	10	35
6.	Share-holders' Funds	10.17	4.58	27.12	92.11	19.49	12.5	41.54	299.72	23.94	134.44
7.	Bad Debt Provision	0.87	3.22	7.15	5.54	1.86	111.96	113.27	296.74	5.04	71.92
8.	Total Reserves	2.67	0	16.16	35.84	9.49	0.5	12.62	190.76	13.94	64.43
9.	Total Operating Income	17.27	12.95	43.77	165.26	54.34	117.41	123.06	476.76	37.04	193.22
	Loan Income	8.09	9.08	35.22	61.66	.	79.06	75.88	198.21	25.07	62.68
	Securities Income	4.75	0.17	3.63	84.66	.	5.32	34.77	160.96	9.95	59.69
	Other Income	14.43	3.71	4.93	18.95	.	33.03	14.41	117.58	2.02	70.85
10	Government Securities										
	Holding	5.93	0.28	41.13	716.71	102	20.5	20	1404.08	16.45	331.18
11	Other Borrowed Funds	0	0	0	0	0	50.32	0	0	0	0
12	Cash Holding	7.49	2.39	14.5	15.65	2.64	57.1	7.46	46.39	11.21	21.59
13	Short-term Assets	21.41	70.86	131.33	114.98	217.26	173.75	104.18	1636.61	192.03	744.33
14	Net Income	2.53	-4.67	21.46	26.83	30.28	0	0	342.18	5.57	62.31
15	Dividend	0	0	0.7	4.77	15	0	0	8.71	1	11.88

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1986

	Bank Code	NBN	PAB	NNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1.	Total Loans	563.14	241.07	287.34	98.65	558.13	1707.02	232.27	5.13	91.38	123.64
	Agric Loans	99.37	.	58.62	7.42	56.37	222.28	.	1.54	.	.
	Manufacturing Loans	191.83	.	100.57	31.39	.	556.94	.	3.12	.	.
	Other Loans	271.95	.	128.15	59.83	.	927.81	.	0.47	.	.
2.	Total Operating Expenses	84.87	33.76	36.45	23.35	84.91	311.42	28.4	1.47	13.84	21.74
	Interest on Loans	1.19	.	17.23	14.82	57.01	182.89	.	0.41	11.66	10.89
	Wages & Salaries	28.69	.	19.22	6.61	12.67	79.48	.	0.36	.	6.86
	Other Expenses	54.98	.	.	1.91	15.24	49.03	.	0.71	.	3.99
3.	Total Assets	886.11	279.97	444.29	453.914	1136.63	4617.64	830	14.16	436.25	247.46
	Risk Assets*	776.87	262.48	263.73	272.77	1024.99	4057.74	420	5.13	138.35	154.18
	Current Assets	48.92	265.73	433.24	352.81	1125.86	559.9	390	14.16	.	93.28
4.	Total Deposit	721.37	200.98	367.82	228.35	694.65	3932.79	308.07	15.41	199.35	209.37
	Time Deposit	163.8	75.65	124.58	114.18	509.36	1511.62	144.16	5.05	.	86.19
	Current Deposit	313.55	70.08	134.55	40.33	134.56	1236.92	113.68	9.78	.	57.86
	Savings Deposit	224.01	55.25	101.87	0.98	34.22	467.33	50.63	0.57	.	65.32
	Other Deposit	0	0	6.82	0	16.5	716.92	0	0	0	0
5.	Total Capital	21.67	11.31	11.75	8	28.9	75	10	3.22	7.5	6
6.	Share-holders' Funds	21.67	42.19	14.46	8.658	41.54	238.84	26.67	2.72	13.9	8.52
7.	Bad Debt Provision	81.72	94.09	3.6	0.71	113.27	281.18	7.02	0.07	2.1	.
8.	Total Reserves	11.67	0.56	2.71	2.66	12.62	163.84	11.43	0	6.2	3.72
9.	Total Operating Income	88.02	10.22	40.22	29.11	123.06	441.98	72.57	1.35	34.4	24.3
	Loan Income	60.64	6.93	36.22	26.61	75.89	153.94	52.17	0.53	16.9	13.37
	Securities Income	10.29	.	.	.	34.77	234.94	.	.	11.7	.
	Other Income	17.48	3.3	3.99	1.49	14.41	53.09	2.04	0.82	5.8	.
10.	Government Securities										
	Holding	19.26	0	23.08	96.09	10.42	2194.14	86.72	0	42.8	10
11.	Other Borrowed Funds	10	0	0	0	0	0	410.21	0	197.5	0
12.	Cash Holding	20.49	8.75	19.71	4.23	7.46	31.35	0	0.15	24.3	0
13.	Short-term Assets	88.46	265.73	19.94	273.23	104.17	528.55	47.48	10.9	273.6	93.28
14.	Net Income	0	23.53	3.77	3.4	4.67	81.9	1.5	-0.12	6.8	-1.56
15.	Dividend	0	0	0	1.5	0	9.7	0	0	2	0

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1987

	Bank Code	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1.	Total Loans	111.367	91.97	312.7	457.86	110.17	982.28	738.71	1872.22	266.32	952.55
	Agric Loans	22.01	15.25	50.47	.	.	.	.	262.11	41.94	162.01
	Manufacturing Loans	27.12	37.1	146.75	.	.	.	.	567.67	95.58	375.89
	Other loans	62.24	39.61	115.48	.	.	.	.	1048.44	128.8	414.56
2.	Total Operating Expenses	22.55	20.3	45.81	141.6	25.51	157.33	53.09	527.76	28.94	87.94
	Interest on Loans	.	11.58	0.15	96.74	38.1	1.25	.	238.12	29.18	103.58
	Wages & Salaries	4.35	0.31	6.02	14	.	39.03	.	143.65	9.12	.
	Other Expenses	18.2	0.5	39.64	30.87	.	117.05	.	145.99	19.82	.
3.	Total Assets	309.96	250.57	491.9	2420.19	1007.06	1608.03	1649.03	5747.58	602.09	2635.59
	Risk Assets*	240.25	246.39	367.64	2304.34	451.02	1307.2	1086.9	3179.32	494.98	1380.11
	Current Assets	301.46	155.92	124.26	115.85	556.04	452.64	400	5640.2	339.79	1254.63
4.	Total Deposit	185.75	224.01	393.56	1546.37	698.32	1183.75	1522.98	4073.69	536.28	1477.7
	Time Deposit	53.42	66.7	105.84	692.09	196.35	346.03	625.65	790.91	231.2	773.22
	Current Deposit	63.26	29.68	77.83	854.27	116.56	369.43	233	1242.04	131.45	370.93
	Savings Deposit	50.68	3.68	192.08	0	2.35	466.57	107.43	1074.58	48.15	182.99
	Other Deposit	16.39	123.95	17.82	0	383.07	1.73	556.9	966.16	125.48	150.53
5.	Total Capital	2.5	2	10.97	20	20	120.02	28.92	63.5	15	37
6.	Share-holders' Funds	18.15	3	28.37	118.19	42.82	12.5	41.97	348.59	28.5	170.84
7.	Bad Debt Provision	1.97	6.39	-17.53	5.16	10.78	116.21	155.36	415.16	7.99	95.55
8.	Total Reserves	5.65	0	17.41	50.81	22.82	0.5	11.32	223.24	13.5	85.84
9.	Total Operating Income	28.05	22.91	47.84	211.44	153.6	157.33	156.26	611.28	15.4	288
	Loan Income	13.92	15.63	32.57	94.6	60.75	112.11	117.21	282.02	42.89	103.58
	Securities Income	5.51	0.28	1.57	97.02	.	9.71	22.47	100.88	1.65	70.21
	Other Income	8.62	7.01	13.7	19.82	.	35.51	16.58	228.4	13.88	114.21
10	Government Securities										
	Holding	11.57	0.28	13.13	1022.25	237	0	0	1181.36	15.39	610.77
11	Other Borrowed Funds	0	0	0	0	0	48.28	0	0	0	0
12	Cash Holding	6.64	1.27	17.16	10.98	3.14	66.46	9.37	34.93	12.1	27.43
13	Short-term Assets	29.46	155.92	124.26	104.87	289.26	223.66	263.5	2084.29	305.27	1254.63
14	Net Income	3.48	2.61	21.18	36.66	89.26	0	0.435	373.15	6.56	87.94
15	Dividend	0	0	0	6.54	0	0	0	10.16	2	15.25

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1987.

	Bank Code	NBN	PAB	NNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1.	Total Loans	656.39	253.67	353.75	98.74	553.64	2240.83	266.59	13.78	131.39	140.39
	Agric Loans	.	.	63.68	68.47	83.05	325.85	.	7.82	.	.
	Manufacturing Loans	.	.	134.42	13.77	.	825.41	.	3.35	.	.
	Other loans	.	.	155.65	54.64	.	1089.57	.	2.61	.	.
2.	Total Operating Expenses	105.07	44.36	53.33	29.91	110.22	392.84	37.04	3.37	73.84	27.43
	Interest on Loans	3.4	2.88	26.27	18.92	76.14	236.92	.	0.91	11.66	14.49
	Wages & Salaries	31.15	.	27.06	9.02	14.98	91.93	.	0.7	.	7.81
	Other Expenses	70.69	.	.	1.96	19.13	63.98	.	1.75	.	5.13
3.	Total Assets	1041.52	406.26	553.46	643.19	1358.01	5656.71	940	1.71	436.25	365.54
	Risk Assets*	839.16	183.88	353.14	279.85	1021.11	3791.5	562	13.78	138.35	324.24
	Current Assets	53.49	392.3	531.72	467.35	1345.14	1865.21	412	1.71	.	141.3
4.	Total Deposit	841.46	280.105	474.64	297.92	868.65	4766.73	477.41	4091	199.35	254.3
	Time Deposit	255.51	113.77	155.55	696.59	574.56	1706.68	261.25	11.89	.	85.98
	Current Deposit	325.27	103.58	151.25	86.91	218.65	1204.889	138.13	27.95	.	81.32
	Savings Deposit	260.68	62.8	127.13	14.41	37.95	555.89	77.64	1.07	.	87
	Other Deposit	0	0	40.11	0	37.5	1299.26	0	0	0	0
5.	Total Capital	21.76	3.18	11.77	10	28.92	75	15	5.44	9	15
6.	Share-holders' Funds	21.76	3.18	14.46	13.54	41.97	266.18	32.7	5.44	17	29.69
7.	Bad Debt Provision	99.01	101.02	3.85	0.41	155.36	394.12	7.2	0.29	3.7	.
8.	Total Reserves	11.76	0.57	2.71	7.54	11.32	191.18	12.41	0	8	24.89
9.	Total Operating Income	108.49	50.46	57.36	44.27	156.26	569.17	92.9	4.19	46	32.51
	Loan Income	70.84	29.21	55.02	39.16	117.21	194.41	61.79	2.52	32.3	16.42
	Securities Income	7.85	8.89	.	.	22.47	234.79	.	0	3	.
	Other Income	37.65	12.36	2.34	2.73	16.58	139.97	31.11	1.67	10.7	.
10.	Government Securities										
	Holding	19.56	39.5	8.69	55.88	26.4	1243.14	157	0	29.7	19.2
11.	Other Borrowed Funds	5	41.35	0	0	0	0	380.33	0	179.5	0
12.	Cash Holding	22.58	12.35	19.91	4.67	9.37	63.08	0	0.55	34.8	0
13.	Short-term Assets	1797.9	394.57	46.57	358.68	263.5	1802.13	58.22	62.31	297.9	191.97
14.	Net Income	0.94	3.87	4.04	7.89	0.44	105.89	2.25	0.82	8.8	5.08
15.	Dividend	0	0	0	3	0	16.34	0	0	3	0

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1988

	Bank Code	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1.	Total Loans	142.23	104.72	371.62	476.76	130.66	1124.66	804.35	2228.88	331.45	1051.51
	Agric Loans	26.23	19.6	65.18	.	.	.	.	329.87	55.09	196.91
	Manufacturing Loans	39.68	27.29	135.72	.	.	.	.	793.48	124.77	432.34
	Other loans	76.32	57.82	170.72	.	.	.	.	1105.52	151.59	422.26
2.	Total Operating Expenses	42.93	29.02	73.11	201.4	119.24	211.11	77.82	661.4	36.75	149.67
	Interest on Loans	.	16.32	0.11	139.55	73.89	2.4	.	262.14	42.4	198.14
	Wages & Salaries	6.35	2.12	6.37	17.37	10.02	45.57	.	172.74	13.29	.
	Other Expenses	36.58	10.58	66.64	44.48	25.33	163.13	.	226.51	23.44	.
3.	Total Assets	5509.76	287.89	705.04	2578.86	1368.6 ₄	2149.41	2082.41	6335.77	662.56	2213.5
	Risk Assets*	394.72	243.54	468.26	1951.89	759.94	1747.1	1155.03	4274.68	549.63	1753.94
	Current Assets	497.71	179.01	236.78	626.98	608.7	828.89	621	6204.92	359.19	959.56
4.	Total Deposit	352.66	238.84	549.71	1901.83	753.21	1595.5	1913.15	4876.54	631.55	1661.31
	Time Deposit	99.11	76.78	141.99	881.88	284.69	504.78	747.7	993.5	225.18	714.12
	Current Deposit	141.89	57.86	95.59	1019.95	187.48	440.9	475.68	1399.13	171.61	526.41
	Savings Deposit	83.5	6.06	252.01	.	4.23	608.71	165.36	1380.19	77.61	288.08
	Other Deposit	27.56	98.14	60.11	0.39	0	41.11	524.39	1103.12	157.16	132.71
5.	Total Capital	25	8.7	16.97	22	20	12	28.92	63.5	15	50
6.	Share-holders' Funds	32.65	17.55	31.94	147.26	85.08	12.5	44	412.76	31	210.46
7.	Bad Debt Provision	16.29	11.14	5.73	9.27	-5.22	112.93	197.75	621.05	8.33	130.99
8.	Total Reserves	7.68	1.61	14.97	71.08	65.08	0.5	11.95	327.03	16	125.45
9.	Total Operating Income	49.04	36.41	76.39	293.71	203.62	211.11	179.85	773.73	87.39	395.66
	Loan Income	24.45	19.76	47.59	96.92	75.8	145.66	139.72	370.76	67.7	192.14
	Securities Income	16.36	1.46	2.01	162.86	.	0.09	19.74	173.68	1.83	99.69
	Other Income	8.23	15.19	26.79	33.93	.	65.39	20.39	229.3	17.83	103.83
10.	Government Securities										
	Holding	6.44	1.03	16.13	1329.39	599.45	0	0	1377.75	7.65	672.67
11.	Other Borrowed Funds	0	0	0	0	0	48.28	0	0	0	0
12.	Cash Holding	6.82	2.78	8.63	23.01	9.396	50.3	11.36	42.15	8.94	29.56
13.	Short-term Assets	108.23	179.01	236.78	144.19	215.88	500.68	113.11	2018.94	301.44	959.56
14.	Net Income	3.67	5.18	29.8	44.94	77.25	0	2.03	511.59	4.5	90.89
15.	Dividend	0	0	0	12.54	34.99	0	0	12.7	2	15.25

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1988

	Bank Code	NBN	PAB	NNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1.	Total Loans	841.22	294.32	490.79	162.16	766.57	2635.46	334.9	20.55	137.43	67.4
	Agric Loans	146.14	.	83.44	25.21	.	416.14	.	11.66	.	.
	Manufacturing Loans	294.39	.	181.59	39.05	.	902.73	.	4.99	.	.
	Other loans	400.69	.	225.77	99.5	.	1316.59	.	3.89	.	.
2.	Total Operating Expenses	144.06	56.53	89.46	47.88	132.69	485.75	45.3	12.63	25.96	49.54
	Interest on Loans	3.61	5.27	47.83	31.55	90.07	271.39	.	5.23	23.99	41.44
	Wages & Salaries	34.39	.	17.09	13.06	18.93	122.23	.	1.06	.	8.1
	Other Expenses	106.06	.	24.54	3.27	23.69	92.13	.	6.34	.	.
3.	Total Assets	1471.5	481.64	808.72	999.06	1285.42	7061.1	1072	53.74	550.8	638.41
	Risk Assets*	1136.79	128.94	548.39	613.52	1160.95	4781.51	578	20.55	219.4	274.58
	Current Assets	136.88	467.54	786.26	732.51	1272.67	2279.59	600	53.74	380.4	363.83
4.	Total Deposit	1185.34	377.02	711.45	427.46	868.53	5872.88	753.94	102.58	324.25	453.9
	Time Deposit	412.48	137.95	257.54	281.69	219.22	2645.2	375.05	54.82	178.34	155
	Current Deposit	452.28	162.12	202.49	135.29	593.7	1461.83	241.86	45.68	32.43	143.8
	Savings Deposit	320.59	76.95	182.29	10.49	52.61	724.79	137.03	2.09	113.48	155.1
	Other Deposit	0	0	69.13	0	13	1041.06	0	0	0	0
5.	Total Capital	21.76	11.37	11.75	10	28.92	75	20	7.57	10.5	20
6.	Share-holders' Funds	21.76	62.88	29.82	25.08	44	328.47	41.46	7.57	20.6	49.43
7.	Bad Debt Provision	118.56	187.82	7.97	0.49	197.75	526.74	9.55	0.35	3.7	27
8.	Total Reserves	11.76	0.56	18.08	19.07	11.95	253.47	16.11	0.53	11.1	35.57
9.	Total Operating Income	148.69	68.85	99.69	75.91	179.85	641.02	143.69	16.33	67.5	50.88
	Loan Income	99.58	39.89	85.86	67.17	139.72	301.18	93.21	9.86	20.4	40.07
	Securities Income	12.06	13.14	10.93	.	19.74	230.28	.	.	29	.
	Other Income	49.13	15.98	2.89	8.74	20.39	109.55	50.49	6.47	18.1	.
10	Government Securities										
	Holding	17.3	0	8.44	36.97	0	1835.07	61	6	68.9	0
11	Other Borrowed Funds	16.5	41.35	0	0	0	0	49.38	0	122.6	0
12	Cash Holding	52.49	15.98	20.74	5.65	11.36	44.73	0	2.56	39.5	0
13	Short-term Assets	467.68	465.66	132.89	342.92	113.11	2234.87	77.74	109.52	291.9	428.27
14	Net Income	-205.49	66.07	51.86	14.54	2.03	83.99	3	3.69	13.8	25.91
15	Dividend	0	0	0	3	0	18	0	0	5	0

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1989.

	Bank Code	PBN	UTB	COB	BCI	NIB	ACB	SBN	UBN	NAB	AFB
1.	Total Loans	152.69	118.89	312.14	388.17	139.51	962.7	899.07	2380.23	317.62	1157.57
	Agric Loans	23.63	24.79	68.67	.	.	.	.	333.23	44.31	234.77
	Manufacturing Loans	41.9	47.34	104.26	.	.	.	.	952.09	127.27	463.52
	Other loans	87.16	46.76	139.22	.	.	.	.	1094.9	146.14	459.28
2.	Total Operating Expenses	72.76	64.85	94.68	209.39	64.21	619.02	123.35	907.01	54.5	201.79
	Interest on Loans	.	40.38	6.28	104.84	47.16	2.49	.	379.6	45.96	263.73
	Wages & Salaries	10.04	7.38	8.53	27.84	16.37	55.66	.	244.51	17.14	.
	Other Expenses	62.73	17.09	79.88	76.71	.	560.87	.	282.89	37.37	.
3.	Total Assets	810.29	570.66	729.83	1757.99	810.08	1855.4	2049.8	7986.08	548.44	2505.36
	Risk Assets*	29.57	559.05	517.01	1179.46	339.8	1463.63	1228.38	3813.88	402.15	1722.17
	Current Assets	790.3	434.19	410.82	578.52	470.28	745.63	1015	7807.24	242.46	783.19
4.	Total Deposit	533.13	489.41	702.84	1053.53	367.55	1549.12	1876.34	5782.83	551.52	1656.46
	Time Deposit	76.56	56.71	143.58	339.17	17.55	287.73	626.87	1150.98	141.33	442.78
	Current Deposit	135.53	57.8	148.61	714.36	213.81	176.28	460.74	1788.7	146.25	595.26
	Savings Deposit	140.96	15.06	355.45	0	7.84	708.86	246.33	1774.73	108.06	412.17
	Other Deposit	180.09	359.84	55.19	0.2	0	76.26	542.4	1068.43	155.89	206.25
5.	Total Capital	25	20	20.39	179.61	20	23.99	28.92	63.1	20	58.34
6.	Share-holders' Funds	37.05	25.9	-39.61	179.61	112.65	-273.62	47.46	533.91	32.91	276.65
7.	Bad Debt Provision	10.93	15.11	86.7	1.32	10.34	465.16	73.74	868.29	9	155.29
8.	Total Reserves	12.05	5.9	-60.01	84.39	96.65	0.5	12.82	443.74	12.91	176.65
9.	Total Operating Income	84.21	77.89	106.38	289.21	206.95	317.7	214.91	1059.42	105.35	481.4
	Loan Income	21.05	33.86	68.99	97.68	80.05	171.88	160.95	475.44	69.79	263.73
	Securities Income	36.6	0.063	1.75	138.2	.	0.069	10.99	176.29	1.01	66.79
	Other Income	26.57	43.97	35.65	53.33	.	145.75	42.97	407.69	34.54	150.88
10.	Government Securities										
	Holding	5.55	0.53	21.13	638.5	174.15	0	0	995.29	5.96	236.89
11.	Other Borrowed Funds	.	.	.	.	.	48.28	0	0	0	0
12.	Cash Holding	10.65	9.9	16.1	23.74	6.45	46.43	10.16	49.19	9.29	57.11
13.	Short-term Assets	540.08	434.18	410.82	47.5	251.1	305.99	64.89	4122.93	209.64	783.19
14.	Net Income	7.53	8.92	54.4	51.4	12.57	-298.12	3.46	679.82	2.91	122.57
15.	Dividend	0	4	0	17.04	45	0	0	15.88	1	18.25

FINANCIAL INFORMATION ON SAMPLE BANKS FOR 1989.

	Bank Code	NBN	PAB	NNB	HNB	SGB	UBA	ABN	GBN	OBN	WBN
1.	Total Loans	802.44	340.76	595.64	168.59	669.54	3066.21	352.26	27.57	165.16	198.65
	Agric Loans	175.87	.	107.22	19.35	.	523.99	.	7.82	.	.
	Manufacturing Loans	361.09	.	226.34	53.01	.	1177.91	.	18.24	.	.
	Other Loans	536.96	.	262.09	96.24	.	1364.31	.	1.51	.	.
2.	Total Operating Expenses	176.81	56.54	127.02	60.27	166.61	659.02	70.81	25.78	39.03	68.13
	Interest on Loans	6.01	5.46	64.32	29.59	103.25	350.21	.	13.79	21.7	25.91
	Wages & Salaries	4125	.	24.74	25.04	26.62	167.15	.	2.06	14.76	13.14
	Other Expenses	129.55	.	37.96	5.07	36.74	141.66	.	9.92	19.96	29.08
3.	Total Assets	1816.54	364.96	1004.72	929.05	1182.84	9205.43	1020	57.59	479.33	890.04
	Risk Assets*	1296.37	163.53	669.69	531.68	1107.79	5675.1	627	20.13	194.43	326.96
	Current Assets	520.17	348.22	965.9	597.72	1161.05	3530.33	400	57.59	284.9	563.08
4.	Total Deposit	1475.34	204.98	882.48	335.23	597.93	8159.29	657.97	170.05	229	654.4
	Time Deposit	369.16	43.12	188.44	162.33	181.52	4025.49	228.87	134.19	50.99	171.1
	Current Deposit	685.04	64.62	218.21	149.29	339.79	2383.39	215.15	32.24	96.02	312
	Savings Deposit	421.14	97.24	262.69	23.61	76.62	1019.91	213.95	3.61	58.16	171.3
	Other Deposit	0	0	213.14	12	133.59	730.51	0	0	23.84	0
5.	Total Capital	1.732	11.37	21.13	12	28.92	75	20	10.11	20.6	20
6.	Share-holders' Funds	1.732	54.79	50.49	43.02	47.46	416.7	43.38	10.11	34.4	67.13
7.	Bad Debt Provision	217.68	210.98	21.83	1.36	73.74	601.84	39.84	5.55	6.4	30
8.	Total Reserves	195.85	0.56	29.36	22.02	12.82	341.76	17.84	1.71	13.8	45.15
9.	Total Operating Income	194.51	79.75	157.44	105.3	214.91	819.64	186.03	29.64	80.2	116.98
	Loan Income	119.83	41.73	134.92	96.62	160.95	379.03	120.03	6.34	26.8	72.48
	Securities Income	8.89	16.38	17.04	0	10.99	258.61	.	.	28.8	.
	Other Income	74.69	23.31	5.48	8.69	42.97	181.99	66.01	23.27	24.6	.
10.	Government Securities										
	Holding	17.3	0	8.07	14.49	0	1049.58	30	25	7.7	60
11.	Other Borrowed Funds	16.5	41.35	0	0	0	0	397.32	.	192	.
12.	Cash Holding	52.49	23.31	30.32	7.23	10.16	68.12	0	3.27	48.9	0
13.	Short-term Assets	467.68	248.22	180.06	371.92	64.89	3462.21	114.36	51.33	236	627.82
14.	Net Income	-205.49	8.08	93.11	25.45	3.46	101.23	1	3.85	13.1	41.43
15.	Dividend	0	0	0	10.5	0	18.75	0	0	5	3